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# Report
# of the Secretary
# of Agriculture
# 1973

United States
Department
of Agriculture

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Department of Agriculture
Washington, D.C.

The President
The White House
Washington, D.C.

Dear Mr. President:

Again it is my privilege to present to you this Report of the Secretary of Agriculture 1973, an account of the services and programs provided by the people of the United States Department of Agriculture in 1973.

The changes and the progress that have been made while carrying out the wide-ranging responsibilities of the Department in 1973 are outlined by each of the agencies which serve within the Department.

It was a year of unmatched achievement for American agriculture. Yet it signaled what I believe is only the beginning of a new era, an era marked by freedom and opportunity for farmers unequalled in the history of our Republic.

Sincerely,

Earl L Butz

Earl L. Butz
Secretary of Agriculture

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# A GIANT STEP FORWARD

The American people rediscovered the farmer in 1973. They learned, too, the esteem in which his products are held throughout the world. It was a year that saw the American farmer rediscover his own self-esteem as price levels reflected to a greater extent his investments of time, labor, and money in the risky task of providing Americans with enough food. It was a year, too, in which the farmer was able to undertake that task in a new atmosphere of freedom—freedom from Government production controls and freedom to try to meet an exploding market demand.

In a year that could only be termed a giant step forward for American agriculture, both U.S. farm prices and that all-important net farm income moved up a third in value. Farm exports almost doubled in value. Yet, it was not a year of unmixed blessings for all farmers; the weather saw to that, as did the fuel crisis, the fertilizer shortage, and the rising costs of production.

At the other end of the food chain, consumers saw food prices rise sharply in 1973. Worse, they saw the kind of market disruptions which can be brought about by inserting price-freezing monkey wrenches into our finely tuned machinery of supply and demand. We learned once more that when you take away the opportunity for a man to make a profit and take away the hope and expectation that he can keep some of that profit for himself, you have taken away the essential ingredient that makes U.S. agriculture work and that which makes it the envy of the world.

Farmers started off 1973 in top financial shape. They had realized a net farm income of $19.7 billion the year before, a new record, plus a record $15.9 billion in income earned from nonfarm sources. They were the proprietors of 2.8 million farms spread over 1.1 billion acres. And while they were about $6 billion deeper in debt on January 1, 1973, than the previous year, their total assets were up some $35 to $376 billion.

Despite a wet spring and because they planted around the clock when weather permitted, farmers harvested 318 million crop acres in 1973. That's 28 million more than in 1972 and the most since 1955. With the added acres, crop production reached 1.7 billion bushels of wheat, 205 million tons of feed grains (including 5.6 billion bushels of corn), 93 million hundredweight of rice, and 1.6 billion soybean bushels. On a base of 1967 = 100, total crop production leaped from 113 in 1972 to 119 in 1973, a record high. Production of wheat, corn, and soybeans was of record proportion by a substantial margin.

Ironically, despite sharp crop production gains, 1973 was even tighter than the year before in terms of total supplies following the harvest. Because of the rising export pace going into 1973, the large old-crop carryovers, normally part of the supply, had been sharply whittled down. By harvest, supplies were down for wheat and feed grains, up only slightly for rice and cotton, but up substantially for soybeans.

Livestock output fell during the year, largely due to uncertainty which resulted from Government's interference in the marketplace. Cattle slaughter, at 33.6 million head, was off 6 percent from the 1972 record. Hog slaughter dropped 9 percent to 76.7 million head and lamb slaughter was off 7 percent to 9.6 million head. Milk output was off 3 percent to an estimated 116.8 billion pounds in 1973. Reversing a long uptrend, broiler meat production slipped 1 percent to 3 billion birds.

Egg output was off 5 percent for the year. Turkey meat production was about equal to that in 1972. Measured against a 1967 base, total livestock production eased to an index of 107 from 108 a year earlier.

With crop prices received by farmers averaging 42 percent more for the year and output increasing, cash receipts of crop producers jumped from a total of $25 billion in 1972 to $38.1 billion in 1973. As livestock prices averaged up a third for the year, livestock producers earned cash receipts of $45.3 billion, some $9.7 billion more than the year before. While farmers claimed a boost of nearly $22 billion in gross farm income in 1973, they also forked out an additional $15.2 billion in farm production expenses, nearly a third more than in 1972.

Still, the net gain was impressive. Realized net farm income rose from $19.7 billion in 1972 to $26.1 billion in 1973. While, like other Americans, farmers saw some of these gains eroded by inflation, 1973's realized net farm income in terms of constant dollars of 1967 purchasing power was still reckoned at about $18.9 billion—well above anything since World War II.

With the rise in farm prices well above price-support levels, direct Government payments to farmers eased from $4 billion in 1972 to an estimated $2.6 billion in 1973.

Sharp reductions in Government commodity holdings were another boon to the taxpayer. Early in 1973 the Commodity Credit Corporation sold off about 400 million bushels of old-crop grain. By the end of the year, uncommitted CCC stocks were reduced to zero or near zero levels for several commodities, including corn, barley, rye, wheat, grain sorghum, cotton, tung oil, linseed oil, and flaxseed.

Farmers benefited from off-farm earnings *estimated at $17.6 billion* in the general economic boom, and their equity position improved as the average value of an acre of farmland jumped 20 percent during 1973.

On January 1, 1974, an accounting of the financial balance sheet of the U.S. farming sector placed total assets of farmers at $431 billion, nearly $80 billion more than just 12 months earlier. Outstanding debt increased by a much smaller $8 billion to a total of $82 billion. So farmers could claim an equity of nearly $378 billion on their total physical and financial assets—$76 billion ahead of the January 1, 1973, amount.

The impetus for agriculture's giant step forward could be found, to a great extent, in the pull of overseas demand for our production. U.S. agricultural exports reached an alltime high of $17.7 billion in 1973, a total that was 88 percent greater than the previous record of $9.4 billion set in 1972.

Expanding demand at home and abroad is one of the most compelling forces for change in American agriculture. Since World War II, our spiraling production ability on the farm has led to surplus after surplus, to Government program upon Government program to manage these surpluses, and, ultimately, to huge Government expenditures to support the programs. We supplied our own consumers with a full diet at low cost and sent farm goods overseas at subsidized rates through a tax-supported system of controlled production. For years the problem has been to keep farm prices from tumbling.

But many of these pillars have been shaken in the past year or two. Rising foreign incomes increased demand for livestock products in Western Europe, Canada, Japan, and other developed countries, stimulating demand for U.S. feed grains and meals.

At the same time, world production shortfalls in grains and protein meals, coupled with currency realignments that improved the U.S. competitive position, helped trigger spectacular export gains. Only 3 years ago, Japan became U.S. agriculture's first billion-dollar customer. Exports to Japan last year catapulted to a value of $3 billion. In the Soviet Union, where weather had sharply reduced grain production, our farm exports more than doubled over the previous year, climbing to $916 million. The People's Republic of China, after 20 years of trade isolation from the United States, bought $575 million worth of our farm products.

In the face of record demand, we set out to encourage a level of production necessary to meet it, while at the same time freeing farmers to make their own production decisions based on what they saw as their best opportunities in the marketplace. The Agricultural Act of 1970 encouraged free and rapid response to market conditions. Over the 3-year life of the act, cropping flexibility was the key to movement of agricultural producers from traditional farming patterns and a stifling atmosphere of production control to more efficient production based on response to signals from the marketplace. The law, which expired in December 1973, not only encouraged flexible response on the farm but also permitted USDA to act quickly in the face of demand to open up 40 million previously idled acres for production in 1973.

While demand for food was burgeoning around the world, the demand for another raw material which falls within the purview of USDA, timber, was also growing at a rapid rate. Our latest 10-year report on the Nation's timber situation tells us that the demand for timber is increasing faster than supplies and that if conditions do not change, this could mean rising prices for timber and timber products.

On the other hand, our studies indicate that the forest lands of the United States —public and private—are capable of producing twice the volume grown today. This can be accomplished by intensifying management on all classes of forest ownerships, with major possibilities for increased production existing on that 60 percent of the Nation's commercial forest area which is held in small private ownership.

Demand for our production of food and fiber is a direct reflection of the growing ability of Americans and the people of other nations to buy what we produce. On the domestic side, 1973 was a boom economic year by any account. The Gross National Product advanced nearly 12 percent for the year. After allowing for price inflation, the GNP growth was still about 6 percent in real terms. Incomes after taxes rose a tenth and still were up 4 1/2 percent, discounting inflationary effects. A big income tax refund, a social security payment boost, rising employment, longer hours, and higher wages all contributed to consumer income gains.

Farm and commodity prices hit peaks during the summer. Even though crop prospects quickly brightened after the delayed planting period, old-crop reserves were unusually low and foreign buyers were placing orders for a year or more in advance.

Meanwhile, livestock marketings were severely pinched in August. Meat, poultry, and dairy producers still had to buy feed at escalating prices but their incomes were being limited indirectly by the Government's imposition of food price ceilings. Under pressure, summer farm prices shot upward.

Although prices for many farm commodities showed some easing in the fall quarter, renewed stories of short world supplies kept the upward pressure on prices of wheat, rice, dry beans, and cotton. Tobacco prices reached a new high in December, and milk prices continued upward.

While there was never a serious shortage of food in 1973, the fate of food prices is closely related to those at the farm and prices in the economy as a whole. The former directly affect the price of raw food ingredients, while the latter, including such components as labor, utilities, transportation, and construction, have an immediate impact on the cost of processing and marketing food.

In 1973, with both farm prices and prices in general rising faster than in recent years, food prices moved up strongly. Retail food prices rose an estimated 14 1/2 percent above the year-earlier average. Still, the share of disposable income spent on food is estimated to have increased an average of 15.8 percent; 15.7 percent was required in 1972. Though this was the first such increase in 15 years, reflective Americans realized they still were getting the world's best food at a bargain percentage of take-home pay.

While Americans spent more on food in 1973, they ate less. Wholly because of prices, food spending rose 11 percent to $139 billion, the largest annual increase since 1951. However, after adjustment for price increases, real food purchases showed the sharpest decline in more than four decades. Food consumption dropped principally because of a 14-pound drop in the pounds of red meat available per person, coupled with declines in the pounds of eggs, poultry, and fish consumed.

It is significant to note, however, that evidence mounted in 1973 that the national goal of ending poverty-related hunger is being attained. The fact that participation in the needy family food programs and in the free-price feature of the school feeding programs leveled off indicates that these programs are effectively reaching Americans in financial need of food assistance. Participation in the programs increased rapidly the previous 4 years in response to Federal-State expansion and outreach efforts. The Food Stamp Program served an average of 12.4 million people per month last year, about 700,000 more than the 1972 average.

Supplying food to Americans has never been an easy job for farmers and 1973 provided its share of difficulties. It rained heavily in the spring, and the Mississippi River shot over its banks to flood 20 million acres of Delta land. Added to the major problems of unplantable fields, the Nation's transportation network was jammed with a record volume of farm commodities moving into export, slowing movement of needed farm equipment, fertilizer, and seed to the countryside. During the early months of 1973, input shortages were mainly due to transportation tieups rather than actual short supplies.

As the year progressed, however, tightening supplies of natural gas limited the expansion of nitrogen fertilizer production; the propane gas supply grew critically tight; and the Mideastern oil embargoes threatened to leave farmers without enough fuel to expand plantings as much as they hoped.

At the same time, domestic price ceilings were limiting domestic fertilizer supplies available to farmers. Fertilizer manufacturers found that they could command prices far in excess of the domestic ceilings on the world market.

During the last months of 1973, Government action solved several of these problems, at least for the time being. By decontrolling fertilizer prices and exacting promises of an all-out production effort, Federal officials made much larger fertilizer supplies available for the domestic market. However, prices jumped 40 to 50 percent in line with world price levels.

Mandatory allocation programs were initiated to make sure that available fuel supplies would be distributed among the most critical uses, including agriculture.

As an example of the troubles that agriculture can encounter even in a booming economy, examine briefly the problems faced by livestock producers during 1973. Despite a promising start and record-high livestock prices, output of nearly every category of livestock product fell from its 1972 level. The year began hopefully with record inventories of beef animals plus prospects of increased livestock production generally. Since record supplies of feed grains and soybeans were in the offing, feed supplies seemed adequate, although January feed prices paid by farmers were running 30 percent over those of the year before.

With incomes rising strongly, consumer use of livestock food products seemed sure to increase. Then things went haywire. Because of the blizzards, mud and floods of winter and spring, disease and death took a larger toll, rates of weight gain slumped, and movement of livestock to slaughter slowed, periodically pinching retail meat supplies. Feed costs soared and soybean meal grew hard to come by during the summer. Supplies of fishmeal, an important feedstuff, were depleted as Peru stopped exporting it because of poor anchovy catches.

On January 1, 1973, use of the cattle growth stimulant DES was restricted. In March, the Government imposed wholesale and retail price ceilings on meat to stop escalating meat and poultry prices. In April, consumers boycotted meat. In June and July, exports of soybeans and other feedstuffs were embargoed in an attempt to prevent a feed shortage before new crops came in. A 90-day ceiling on food prices at wholesale and retail was imposed in June, and later extended into September for meat only. In August, livestock producers reacted sharply to these pressures. Cattle and hog producers held animals off the market in anticipation of higher prices after the 90-day freeze. Poultry producers had already been culling flocks heavily under pressures of skyrocketing soybean and feed prices. Dairymen were culling herds heavily and cutting back on feed rations, reducing milk output. After September, feed prices remained at high levels while livestock prices weakened.

Accordingly, livestock output fell rather than increased during 1973. Cattle slaughter, at 33.6 million head, was off 6 percent from the 1972 record. Hog slaughter dropped 9 percent to 76.7 million head and lamb slaughter was off 7 percent to 9.6 million head.

The impact on other livestock enterprises was also heavy. Milk output was off 3 1/2 percent to an estimated 115.6 billion pounds for 1973, reversing a 3-year period of gradual recovery in milk production. Much of the 1973 loss in milk output derived from slippage in the average amount of milk produced per cow, the first decline in this measure in nearly 30 years. This stemmed from reduced feeding of high protein supplements and no compensatory rise in feeding of grains and concentrate feeds. During the preceding decade, dairy farmers had upped the amount of grains and concentrated feed per cow by 5 1/2 percent a year.

The discouraging dairy feed picture contrasted sharply with the high prices being offered for slaughter dairy cows. Increasing numbers of dairymen took the offer and culled herds or quit outright. Dairy cow numbers were off nearly 3 percent for the year, enough of a drop to virtually guarantee a further drop in milk output for the following year.

Actually, the big impact of the wet spring was on the distribution of acreage among competing crops. Cotton plantings were down sharply in the Delta States. But more cotton was planted in Texas and Oklahoma and yields nationally were well above the low level of 1971.

Although field crops had a chance to recover after a weather-delayed start, vegetable crops in process were heavily damaged. The spring onion and potato crops were disasters and wet, cool weather in the spring plagued California's truck regions, sending produce prices sharply upward. The summer onion crop recovered sharply but the fall potato crop, which normally supplies three-fourths of the year's supply, was only a little larger than in 1972. Potato stocks remained tight and retail fresh potato prices stayed high through most of 1973.

Although fresh vegetable supplies increased during the final months following excellent crops, sharp reductions in carryover packs of processed vegetables kept total supplies lower than a year before.

Fruit fared better in 1973. The preceding season saw the smallest deciduous fruit production in 25 years, blamed partly on a freeze that cost California nearly half its grape crop and partly on Hurricane Agnes. With good weather, grape and deciduous fruit and nut production all registered strong advances in 1973.

While faced with unprecedented demand and rough bouts with nature in 1973, the American farmer remained concerned about the continuing conservation of precious agricultural resources. The U.S. Department of Agriculture intensified its efforts to help farmers and ranchers in their conservation work while moving toward higher agricultural production.

Conservation teams in the Department gave first priority to helping farmers select acreages for intensive farming that can be protected adequately from soil erosion. Along with the fuel situation and the continuing need for rural development and increased production, conservation was a key subject of educational efforts by USDA and the Cooperative Extension Service.

The system of information exchange which made possible America's agricultural revolution through a network of national, State, and local offices proved its unique worth again. Fuel problems which arose locally were transmitted quickly to State and national levels for solution when they could not be solved at local levels. Ideas on how best to manage energy and fertilizer on farms were garnered nationwide and shared with all farmers through a series of fact sheets, print media releases, and radio and television shows.

The educational and organizing efforts of the Department were put to work also in the interest of rural development, one of USDA's foremost responsibilities.

Communities determined to improve themselves received record amounts of assistance from USDA, not only in terms of education and organization but also in terms of federally guaranteed credit for ownership and operation of farms, for town and country housing, for water and waste disposal systems in rural towns and the countryside, and for other projects improving the use of land and water. Far-reaching major provisions of the landmark Rural Development Act of 1972 were implemented in 1973, including coordination efforts and community facility business loans and development grants.

The demands of the future in rural America not only challenge the organizational and financial resources of today but also draw relentlessly upon the imagination and skills of thousands of scientists in hundreds of universities across the land. In a very real sense, the work of these dedicated persons not only sparked the farm revolution but keeps it moving in a continuing march of progress. USDA worked closely with such scientists in 1973 in such fields as production, pesticides, and nutrition.

Other scientists, economists, technicians, and experts devoted their energies in 1973 to aiding and policing the agricultural system, from the soil to the market, and measuring and reporting the forces which change the system and affect the lives of every American.

Ours is a great agricultural system, not only because of the dedication of those who are involved in it but also because of our competitive incentive system which rewards a farmer for the work he performs, the investments he makes, and the chances he takes.

Last year was a landmark, and, although it was not without difficulties, the size of its achievements can be classified only as a giant step forward in America's greatest industry.

# INTERNATIONAL AFFAIRS AND COMMODITY PROGRAMS

## Agricultural Stabilization and Conservation Service

In a year of records and challenges, the Agricultural Stabilization and Conservation Service (ASCS) played a lead role in agricultural developments. In this role, it contributed substantially to—

- Reduction of Government controls in farming.
- Record commodity production.
- Monitoring of agricultural fuel and fertilizer.
- Announcement of a new conservation program.

The ASCS objectives were to encourage a level of U.S. food and fiber production that would meet domestic and export demand, to provide farmers freedom to make their own production decisions, to assure farmers the opportunity to earn a fair income in the marketplace, and to assist farmers in protecting basic natural resources.

### Getting Government Out of Farming

The Agricultural Act of 1970, which had introduced a market-oriented farm policy and the set-aside concept of acreage diversion, expired in December 1973. Its expiration marked the culmination of a 3-year effort to remove Government control over farmer planting decisions and farm production.

The 1970 Act was designed to stimulate a shift of U.S. farm policy from one of curtailed production and Government-created scarcity to a policy of production in response to market demand at home and abroad. The success of this policy is reflected in the record $26.1 billion realized net farm income and record commodity production of 1973.

Growing export demand for grain and protein, coupled with shifts in production patterns, led to a record $17.7 billion in agricultural exports for 1973 and raised expectations for close to $20 billion in fiscal 1974. To assure adequate agricultural commodities to meet demand, ASCS reduced feed grain and wheat set-aside requirements as provided by the 1970 Act. Further, ASCS lifted a ban on haying and grazing on set-aside acreage in order to avoid shortages in livestock feed, and announced release of 40 million previously idled acres for production in 1973.

To bring added grain into the free market supply, ASCS announced that reseal loans on all farm-stored grains would not be extended. The agency also issued loading orders for CCC-owned grain in country warehouses to be moved to terminal locations more readily accessible to the marketplace. Uncommitted CCC stocks were reduced to zero or near zero levels for several commodities, including corn, barley, rye, wheat, grain sorghum, cotton, tung oil, linseed oil, and flaxseed.

### Record Production

A record number of farmers participated in the wheat and feed grain programs in 1973. More than 1.8 million farms, or 99 percent of those enrolled, participated in the feed grain program. Feed grain production totaled an estimated 205 million tons, up 2 1/2 percent from 1972. In the wheat program, 1,053,360 participating farms also constituted 99 percent of those enrolled. Total wheat production was about 1.7 billion bushels, up 11 percent from 1972.

In the cotton program, 226,281 farms, again 99 percent of those enrolled, participated. Cotton farmers produced an estimated 13 million bales, about 5 percent less than in 1972.

### Energy Situation

Petroleum fuels are essential to modern agricultural production, and ASCS was called upon early to assist in solving fuel supply problems. A late harvest caused by wet weather in the fall of 1972 brought exceptionally heavy fuel requirements for crop drying, further contributing to the acute fuel shortage. ASCS field offices were assigned to monitor the fuel situation for agriculture. When the voluntary petroleum allocation program was begun in May, a number of ASCS personnel were detailed to the Federal Energy Office. A USDA energy office was established, and an ASCS assistant deputy administrator was designated director.

### New Conservation Program

To strengthen conservation and environmental protection measures on U.S. farms, the Rural Environmental Conservation Program (RECP) was announced in late December. RECP will be administered through the ASCS farmer-elected committee system, with the Soil Conservation Service and the Forest Service providing technical and planning assistance. The program, which retains some features of the old Rural Environmental Assistance Program (REAP), will share with farmers and other landowners from 50 to 75 percent of the cost of carrying out approved forestry and conservation practices under annual and long-term agreements.

### Water Bank

In late December, ASCS also announced the continuation of the Water Bank Program for 1974. Under this program, 10-year contracts are signed with owners of eligible wetlands in important migratory waterfowl nesting and brooding areas of the Nation. Annual payments are made to landowners during the contract period. In return they agree to maintain the wetlands for waterfowl nesting and brooding purposes.

### Emergency Assistance Programs

ASCS helps farmers hard hit by natural disasters through the Emergency Livestock Feed Grain Program, the Emergency Conservation Measures Program, and a program to grant emergency grazing and haying privileges on cropland taken out of production. Since July 1973, Government-owned feed grains have been made available at reduced prices in 66 counties in eight States to farmers suffering from natural disaster.

During 1973, ASCS helped meet the needs of 383 counties in 27 States hard hit by natural disasters, providing $12.4 million to share in the cost of emergency conservation measures needed to rehabilitate farmland. Of the $12.4 million, $7 million was for damage caused by spring flooding of the Mississippi River in approximately 200 counties in 11 States.

### Management Improvement

In an updating of the organizational structure of USDA and improvement of services to farmers, ASCS consolidated regions and commodity divisions and realigned responsibilities of its deputy administrators. Under the new organizational setup, ASCS has done the following:

- Consolidated functions and reduced span of control.
- Reduced by 25 percent the number of major organizational units other than State offices.
- Aided in reducing the average grade level of ASCS through reduction of supervisory positions.
- Improved program and management effectiveness.

In 1973 there was a 23.5-percent reduction of ASCS personnel in some 2,800 agricultural counties—from 12,443 in June to 9,518 in December. Permanent full-time federal ASCS employees in Washington and field offices were reduced by 14.9 percent—from 3,371 in May to 2,872 in November.

### Export Marketing Service

Commodity shipments under Public Law 480 in fiscal year 1973 were valued at about $965 million, a continuation of the trend of recent years.

Total value of shipments under title I of the Food for Peace program was $677 million. The commodities were wheat and its products, 90 million bushels; rice, 21 million hundredweight; feed grains, 800,000 short tons; cotton, 624,000 bales; vegetable oil, 234 million pounds; and tobacco, 26 million pounds. Major recipients were South Vietnam, South Korea, Indonesia, Pakistan, and Israel.

Title II shipments through the voluntary relief agencies, World Food Program, and government-to-government grants were valued at $288 million. Wheat and its products were also the major commodities shipped under these programs. They totaled 57 million bushels. Feed grains and their products were the second most important, totaling 262,000 short tons. These quantities include 590 million pounds of blended foods. Major recipients were Bangladesh, India, and the Philippines.

The Export Marketing Service also administered the Barter Program, CCC credit, and export payments on wheat and rice. In fiscal year 1973, the value of agricultural commodities exported under the Barter Program reached a record $1.1 billion. U. S. agricultural exports financed under CCC credit totaled $1,029 million in fiscal year 1973, compared with $372 million in the preceding year. The export payment program declined as a result of the zero payment in effect for wheat and rice during calendar 1973. In fiscal 1973, export payments were made on about 70 percent of the wheat and 25 percent of the rice, whereas in fiscal 1972 payments were made on most exports of these commodities.

### Federal Crop Insurance Corporation

Federal Crop Insurance (FCI) protection moved above the billion-dollar level in 1973 for the first time. The previous high was $947,567,000 of protection in 1971. At the same time, the Federal Crop Insurance Corporation experienced a fourth consecutive year in which insurance premiums exceeded indemnities paid. Indemnities had exceeded premiums by substantial amounts in 1967, 1968, and 1969.

In 1973, a year of record business volume, only 66 cents of each premium dollar was used to pay indemnities to insured farmers. The 0.66 loss ratio for 1973 compares with loss ratios of 0.60 in 1972, 0.60 in 1971, and 0.94 in 1970. Indemnities of $31,474,000 were paid from 1973 premium income of $47,658,000. Unless additional damage should occur to citrus crops, the cumulative loss ratio for the 1948-73 period will be reduced to 0.91, compared to the 0.90 actuarial goal of the corporation for its crop programs during this period.

The favorable 1973 experience was due chiefly to the loss ratios on the high liability crops—0.84 for wheat, 0.28 for corn, 0.69 for tobacco, 0.32 for soybeans, and 0.91 for cotton.

Despite the very favorable total experience of the corporation in 1973, the high-risk nature of insuring crops against the risks beyond man's control is well illustrated by seven out of 22 crop programs that required more than the annual premium to pay indemnities. These were programs relating to apples, flax, grapes, oats, peas, peaches, and sugarcane.

Experiment Successful

The corporation is expanding a successful experiment with an improved management practice to be followed in more counties producing corn, cotton, and soybeans. Insureds qualify for higher protection under this actuarial approach by meeting specified cultural practices that increase production prospects. This is another step in the individualized underwriting aimed at providing both sounder and more equitable insurance offers. Experience has revealed that individual underwriting is the soundest and most practical method. But satisfactory individual production figures are not yet available for most crops.

Two actuarial approaches are being tested under which the individual's insurance experience will increase or reduce the amount of protection. Under one approach, the insured's loss ratio and number of years without a loss will adjust his coverage upward or downward. Another coverage adjustment table is being tested in some new counties under which favorable experience will increase the insured's level of coverage above the base percentage at which the insurance is started.

The new farm act emphasizes the farmer's need for protection in the event of crop failure and the value of such protection to the economy. Effective in 1974, it provides payments when disaster prevents planting or causes severe crop failure. While these payments are not sufficient to return the production costs, this limited protection against the full impact of crop disaster, when combined with Federal Crop Insurance, will enable farmers to have more income protection than at any time in history.

### Foreign Agricultural Service

During calendar year 1973, the total value of U.S. agricultural exports reached an alltime high of $17.7 billion, and during the first six months of fiscal 1974 it was moving at a record rate toward an estimated new high of $20 billion for the fiscal year. The 1973 export total was 88 percent greater than the previous record of $9.4 billion set in 1972 and marked the fourth straight year of increase in U.S. agricultural exports.

The volume of farm exports, which reached an unprecedented 92 million metric tons, accounted for around 40 percent of the value gain, with higher prices contributing the rest. Export records were set for wheat, corn, soybeans, lemons, grapefruits, fresh vegetables, soybean meal, corn byproducts, and live animals. Value totals exceeded totals in 1972 for all other commodities except dairy products and soybean oils. Grains, soybeans, and the products of each supplied more than three-fourths of the increase in agricultural exports.

The sharp increase in agricultural exports boosted the U.S. agricultural trade balance to a record $9.3 billion for 1973; agricultural imports totaled $8.4 billion. This agricultural contribution provided the Nation with a trade surplus of $1.7 billion by more than offsetting the deficit in nonfarm trade of $7.6 billion.

World production shortfalls in grains and protein meals, and currency realignments that improved the U.S. competitive position triggered the spectacular gains in farm exports, but the underlying growth factor has been rising foreign incomes, especially in Western Europe, Canada, and Japan. Increased demand for livestock products in these and other developed countries has stimulated rising demand for U.S. feed grains and meals, the raw materials of a modern livestock industry.

Highlights of the Export Pattern for 1973

Highlights of the export year included the shipment of more than $3 billion worth of farm exports to Japan, which only 3 years ago became U.S. agriculture's first billion-dollar customer; the entry of the Soviet Union into the U.S. market for massive imports of farm commodities totaling more than $900 million; and the emergence of the People's Republic of China as a significant market for U.S. farm products.

Exports to Japan rose by $1.6 billion, or 112 percent over exports in 1972, to reach $3.0 billion. The increase was largely in grains, soybeans, cotton, and hides and skins; but shipments of fruits and vegetables, soybean meal, and meats also showed good gains.

U.S. agricultural exports to the Soviet Union, where weather sharply reduced grain production, climbed to $916 million, compared with $430 million in 1972. The increase to the Soviets represented 7 percent of the total increase in U.S. farm exports. Wheat was the leading export, with shipments totaling 319 million bushels worth $552 million; followed by feed grains, 4.2 million tons worth $240 million; and soybeans, with shipments of 18 million bushels valued at nearly $67 million. The Soviet Union also took 48,000 cattle hides, 46 million pounds of linseed oil, 11 million pounds of lemons, and 1.1 million pounds of almonds.

The People's Republic of China, after 20 years of trade isolation from the United States, bought $575 million worth of U.S. farm products. Wheat, with a value of about $278 million, and corn, valued at $132 million, were the leading U.S. exports to China, which also took $100 million worth of U.S. cotton. Other exports included soybeans, soybean oil, tallow, tobacco, and cattle hides.

While exports to Japan, the Soviet Union, and China were the most noteworthy, all major areas took more U.S. agricultural products in 1973 than they did a year earlier. Shipments to Western Europe totaled $5.6 billion, an increase of 67 percent. Of this total $4.5 billion went to the enlarged European Community, a gain of 66 percent. The value of shipments to Latin America totaled $1.7 billion, a gain of 94 percent. Shipments to Asia, including Japan and China, rose by 99 percent to $6.5 billion, putting that region ahead of Western Europe as a market for U.S. farmers.

The calendar year's total exports, valued at $17.7 billion, included around $16.8 billion in commercial sales, which were responsible for the entire export gain. Sales under Government-financed programs declined to an estimated $900 million, the lowest level since 1954, when shipments under P.L. 480, the Agricultural Trade Development and Assistance Act, began.

Market Development

Mindful that successful export promotion is a continuing process, necessary in years of sales growth as well as decline, Foreign Agricultural Service was active in foreign markets during 1973, leaning heavily on its program of cooperative agreements with agricultural commodity trade associations, which was started in 1955.

In view of the unusual world agricultural supply and demand situation, direct FAS promotion projects were cut back. At the same time, more emphasis was placed on the trade servicing aspect of the trade association, or cooperator program, and less on cooperator consumer promotions. Trade servicing generally was concentrated on promotion of bulk commodities, such as wheat, feed grains, cotton, and soybean oil. The commodity activities were designed to inform and influence foreign importers, processors, and government officials regarding the availability, quality, and price of U.S. agricultural products.

The cooperator program includes activities in 75 countries and involves more than 40 U.S. agricultural trade organizations. Total promotion expenditures under the program in fiscal year 1973 were about $32 million, of which more than two-thirds ($22 million) came from private trade sources.

The following are some examples of FAS private trade cooperative projects in 1973.

—A livestock marketing team, comprising officials of a Holstein and Hereford breed association and an FAS marketing specialist, promoted the sale of U.S. breeding cattle in Czechoslovakia and Hungary. Sales of 1,982 head of Holstein and 980 head of Hereford breeding cattle were made to Hungary.

—Representatives of the Western Growers Association (WGA) went on a sales and study mission to Tokyo in the spring to assess the market potential for fresh U.S. produce. As a result, the United States sold more than $3 million worth of Arizona and California produce to this market for the year.

—The American Soybean Association, through the School Lunch Study Institute in Tokyo, successfully introduced to school children a sandwich spread containing 30 percent soy oil and 30 percent peanut butter. By year's end, sales had reached a level of 8 to 10 tons of U.S. peanut butter and soybean oil per week.

### Expansion in Trade Servicing

Trade servicing outside the cooperator program was expanded during 1973 with improvement of the FAS Trade Opportunity Referral Service (TORS), which brings U.S. importer trade queries to the attention of U.S. suppliers.

U.S. agricultural attachés reported that more than $10 million worth of sales were developed during the year from TORS contacts. The number of foreign trade leads processed amounted to 1,306, more than double the number processed the previous year. The number of U.S. exporters using the service grew from 1,900 to 2,500.

While the direct market promotion projects of FAS were reduced in number, several successful events were held. These included participation in both livestock and processed foods exhibits.

It is estimated that combined sales of over 3,000 head of U.S. livestock from three shows in Italy in which FAS and segments of the American livestock industry participated totaled more than $6 million. These shows were two international dairy fairs at Cremona and the agricultural fair at Verona.

In other parts of the world, 84 U.S. commercial firms and 4 U.S. commodity cooperators showed a variety of U.S. products in the American Food Exhibition at the U.S. Trade Center in Tokyo and a companion institutional foods exhibit in a Tokyo hotel. Floor sales plus projected followup sales were estimated to total around $11 million.

At home FAS broadened the base of its activity with State departments of agriculture by helping in the formation of two new regional State export development organizations, bringing the number of these groups to five and States represented to 41.

Eleven states formed the Eastern U.S. Agricultural and Food Export Council Corporation in July, and 14 more organized to form the Southern U.S. Trade Association in September. The other three State organizations are the Mid-America International Agri-Trade Council (MIATCO), Atlantic International Marketing Association (AIM) and Pacific Northwest International Trade Council (PNITC). They assisted in staging food exhibits, sales team projects, and other overseas promotional activities. AIM itself sponsored and managed a U.S. food show in Bermuda in October in which 27 U.S. commercial exhibitors participated.

State departments of agriculture also furnish marketing representatives for FAS field assignments and escort officers for commercial sales teams who go abroad to promote brand food products in an FAS-State program coordinated by the National Association of State Departments of Agriculture Subcommittee on International Trade.

The regional State groups work closely with FAS to interest U.S. food companies in participating in FAS overseas food shows. Unaffiliated States also contribute time and resources to promote these events.

## International Agriculture

Highlights of an active year for FAS specialists in international trade were the signing and implementation of an agreement between the United States and the USSR for cooperation in the field of agriculture, and the formal opening of a new round of multilateral trade negotiations under the General Agreement on Tariffs and Trade (GATT).

*U. S. and Soviet Union Exchanges.* The agreement with the Soviet Union provides for the exchange of information and research in agricultural economics and technology. The cooperative agreement, signed June 19, 1973, enlarges the principles and aims of broader exchanges affecting agriculture previously agreed to by the two countries during President Nixon's visit to the Soviet Union in June 1972. It provided for the establishment of a joint committee on agricultural cooperation to implement and supervise the agreement, and also established two working groups under the joint committee—one for agricultural economic research and information, and one for agricultural research and technology.

The June agreement was implemented for the first time when the joint committee met in Moscow in November to establish channels for the exchange of research and information. A primary objective of the U.S. delegation, headed by Carroll G. Brunthaver, then Assistant Secretary of Agriculture for International Affairs and Commodity Programs, was to obtain agreement from the Soviet Union to provide agricultural economic information that will help the United States in planning for the production and export of major commodities. The Soviets agreed to furnish detailed crop and livestock information not previously available. The data the Soviets will furnish include preliminary and final data on planted areas; yield and production of all crops, including 10-year histories; monthly and yearly data on livestock numbers; an annual balance sheet of major animal feeds; and data on all major crops, livestock, and meat procurements listed in annual plans as approved by the Supreme Soviet.

Both delegations agreed that the agricultural economic joint working group would meet in the spring of 1974 in Washington to discuss the current situation and outlook for U.S. and Soviet agriculture. The joint working group on agricultural research and technology also will meet in Washington in the spring. The working groups will develop and implement cooperative projects through meetings, seminars, exhibitions, consultations between specialists, and exchanges of teams to study commodity production, marketing, and processing.

An important American objective in these exchanges is to foster improved livestock production in the Soviet Union, thus increasing the potential market for American feed grains and soybeans. The joint program in research and technology is designed to involve USDA, State universities, private firms, and other organizations. It will be carried out by exchanges of scientists and technical information, as well as through joint research. Major programs agreed upon were plant, livestock, and soil sciences and mechanization.

Plant science activities will concentrate on germ plasma evaluation and exchange, plant breeding, agricultural methods, improvement of crop plants and ornamentals, and plant pathology.

A program for livestock and veterinary science was developed for all classes of livestock. Primary U.S. emphasis in the first phase of the program will be on sending research teams to study current Soviet laboratory research that may be of substantial benefit to U.S. scientists in several areas of study.

Improvement in the use of soil and water resources is the objective of the soil science program. In the initial phase of the program, two major areas of work will be studied: Management of water, gases, salts, and heat in the soils and wind erosion.

The mechanization program will include research on the development of standards for testing agricultural equipment; wet fractionation of green plants to obtain maximum nutrients; production of crops under semiarid conditions; machines for growing, harvesting, storing, and processing agricultural crops; and the mechanics and management of large-scale operations.

*Negotiations for Liberalization of Trade.* Negotiations continued on several fronts in the continuing U.S. effort to liberalize the movement of world agricultural products. Some successes were achieved in this area.

The multilateral negotiation under the General Agreement on Tariffs and Trade (GATT), which the United States had called for in 1972, was formally opened in Tokyo in September by a Declaration of Ministers of the nations involved. The Declaration of Ministers outlined the aims of the negotiations and established a trade negotiations committee (TNC) to devise and put into effect appropriate procedures for carrying out the negotiations. FAS was represented at the first TNC meeting in Geneva in October.

FAS trade specialists are working with other agencies in the executive branch on preliminary activities required to clear the way for actual negotiations, which are expected to begin in 1974. Issues scheduled to be covered in the negotiations include tariffs, nontariff barriers, and other measures which impede or distort international trade in both industrial and agricultural products.

FAS has also played a leading role in the GATT negotiations with the European Community (EC), which began last March under article 24:6 of the GATT. The purpose of these negotiations is to limit the disadvantages to U.S. trade caused by the entrance of the United Kingdom, Ireland, and Denmark into the Community and to compensate the United States for the commitments those countries are renouncing because of their entry.

Other negotiations with the EC were conducted by means of scheduled consultations in March and October, consultations arranged through the GATT complaint procedure, and visits of various delegations to Washington, Brussels, and, the capitals of the EC member states. These discussions resulted in the following:

- The European Community's agreement to withdraw monetary compensatory taxes collected in excess of GATT-bound duty rates on approximately $39 million worth of imports from the United States.
- The Community's revision of import licensing restrictions which discriminated against imports of U.S. rice.
- The United Kingdom's agreement to phase out restrictions on fresh and processed citrus products by 1975 and to increase quotas for cigars and rum until restrictions are removed in 1976 and 1977.
- France's agreement to increase quotas for dried and dehydrated vegetables, canned peaches, and canned fruit cocktail until the restrictions are removed in 1975.

Preparatory work has also begun for deciding how the international food situation will be considered in the OECD, FAO, and the UN World Food Conference proposed for 1974 by Secretary of State Kissinger.

In bilateral trade actions during the year, particular emphasis was placed on Japan, which continues as the leading importer of U.S. farm products. Trade barriers still exist between the United States and Japan, and were the subject of frequent consultations between the two governments in 1973.

Efforts to liberalize trade have resulted in revaluations of the yen; improvement in the competitive position of U.S. products; further reductions in the number of quotas the Japanese impose on imports from the United States; reductions in tariffs, and the elimination of most export incentives and "buy Japan" procurement policies.

The ninth United States-Japanese ministerial meeting, held in July 1973, resulted in Japanese agreement to respond to a longstanding USDA request for meaningful forecasts of Japanese import needs. In a subsequent meeting with officials of the Japanese Ministry of Agriculture and Forestry in October, detailed projections of Japanese imports from the United States and other countries to July 1974 were provided.

Other trade liberalizing actions taken during 1973 include the following:

- *France's* liberalization of quotas and establishment of a schedule for the phaseout of quantitative limitations on imports of dried and dehydrated vegetables and certain canned fruits.
- *West Germany's* indefinite extension of the issuance of import permits for horses from Western Hemisphere countries.

- *Italy's* renewal of the import period for grapefruit, which was to have expired March 31, 1973.
- *Canada's* temporary reduction of tariffs on certain livestock and livestock products and selected fruits and vegetables.
- *Portugal's* reclassification of soybean oil as an edible oil, thus permitting domestic consumption and increased imports.
- *Algeria's* institution of a new tariff system which provides for lower duties on the entry of a number of agricultural products.
- *Ecuador's* removal of the tariff on wheat and lowering of the rate of duty on oats and husked oats for 1 year.
- *Greece's* exemption of soybeans crushed for oil exports from all taxes, duties, and tariffs; reduction of the ad valorem duty rate on animal fats and oils by 17 percent; and extension of the period of duty-free importation of animal feedstuffs for 1 year.
- *Iran's* reduction of the deposit for registrations of butter, cheese, eggs, cereals, and certain feed grains and removal of the restrictions on imports of boiled sweets, biscuits, and sausages.
- *South Korea's* implementation of partial tariff reform, including the reduction of duties on breeding stock, dairy cows, and sausages.
- *New Zealand's* consent to an increase of American shipments of turkey rolls and roasts through an increase in the licensing allocation.

## Agricultural Marketing Service

Developing standards for food and farm products to help buyers and sellers on opposite coasts for halfway around the world buy and sell farm products on the basis of known specifications is one of the major missions of the Agricultural Marketing Service (AMS). Producers, processors, packers, wholesalers, retailers, and consumers share in the establishment of such standards.

For instance, in 1973, at the request of apple juice processors AMS developed proposed standards for frozen concentrated apple juice to help processors market this relatively new product. Other firsts were adoption of official standards for bullock beef, mohair top, Colby cheese, Monterey cheese, turkeys for further processing, and nest-run eggs.

The establishment of product standards for beef from young bullocks could help expand the supply of beef available to consumers and provide an alternative to beef from steers. Before establishment of the standards, little if any bullock beef was marketed at the retail level. It will take some time before an appreciable amount of bullock beef reaches stores, but a small percentage is now being graded and identified. Graded bullock beef will carry the "bullock" identification because it may be more variable in palatability than steer beef.

The new standards for turkeys for further processing help producers get a fair price for their product based on the value of the turkeys for use in turkey rolls and roasts.

The purpose of the new standards for nest-run eggs is to anticipate or project the grade yield of eggs that have not been washed, graded, or sized, making it possible to trade on the basis of size and grade without an initial grading in bulk form and a further grading before actual sale.

In another aspect of their work, standardization specialists began a monthly survey of packing plants to determine the grade and related characteristics of the Nation's fed beef supply. The results of the survey will give an estimate of the characteristics of the beef population, which will be used as a benchmark for comparison with changes in the grade and yield of our beef supply.

### Developments in Grading

While standards development is the first stage in facilitating mass trading in farm products, the second stage is the grading and inspection services provided by AMS, often in cooperation with State agencies. In most cases, grading is a voluntary service which must be requested and paid for.

Two major developments in grading services occurred in 1973. A new agreement between AMS and the Food and Drug Administration applies to canned, frozen, and other processed fruits and vegetables and manufactured milk products such as nonfat dry milk, butter, and cheese. It provides for greater exchange of information on food inspection and grading to assure that adulterated food does not reach consumers.

A change in regulations for grading canned, frozen, and other processed fruits and vegetables allows greater use of the U.S. grade name or grade shield on these products by processors. Before the change, only processors who used the continuous inspection service could label their products with the U.S. grade name or shield. Now products inspected in USDA-approved plants may bear the U.S. grade name.

*Percentage of Selected Farm Commodities Graded.* The following tabulation gives estimates of the percentage of total production of selected farm commodities officially graded during fiscal year 1973.

| *Product* | *Percentage Graded* |
|---|---|
| Beef | 61 |
| Turkey | 95 |
| Chicken and other poultry | 73 |
| Eggs | 33 |
| Butter | 69 |
| Fresh fruits and vegetables | 50 |
| Frozen fruits and vegetables | 80 |
| Canned fruits and vegetables | 40 |
| Cotton | 97 |
| Tobacco | 97 |

Significantly, the 7 billion pounds of beef yield graded in 1973 represented 34 percent of production, compared to 25 percent in 1972. Also, a record 3.4 billion bushels of grain for export was inspected. To facilitate inspection and movement of export wheat, AMS inspectors developed methods of inspecting wheat handled at coal-loading facilities.

The beef carcass data service administered by AMS graders was expanded in 1973. This program helps farmers produce the kinds of meat consumers want by providing a system for following each animal through the slaughter plant, and recording and reporting to the producer its various characteristics that determine the grade and yield of usable meat. The service now operates in cooperation with 29 livestock and trade organizations and State departments of agriculture.

Since the service became nationwide in 1972, data have been collected on about 10,000 carcasses. Some 73,000 eartags, used to mark the animals on which data are requested, have been distributed. This program will help ranchers produce meat animals having a greater yield of usable meat per 1,000 pounds of carcass beef.

In 1973, a four-part consumer education package included 14 "How to Buy" food publications; a teachers' guide for use of these and related materials in secondary and adult education classes; a Spanish-English publication, and color posters. Of the 14 individual pamphlets, 13 are also available in Spanish

### Market News Expansion

The collection and dissemination of market intelligence is vital to producers and marketing agencies in making daily marketing and production decisions. The market news operation of USDA has been in business since 1915, when a small office at Hammond, La., issued its first report—on strawberries. (The Hammond office was closed in 1973, a victim of rising costs, but news on the prices, supplies, and market conditions of Louisiana strawberries is continuing through the combined efforts of the New Orleans and Baton Rouge offices.)

Increases in the broadcast of market news and in reporting shipping point information from terminal market offices, rather than directly from shipping points, were signs of the times in 1973. The continuing trend toward decentralization in marketing virtually every commodity except tobacco meant market reporters had more areas to cover—and had to find economical and efficient ways of reporting. Higher postage costs meant most mimeographed reports could no longer be mailed daily.

However, the necessary coverage was provided—even expanded to meet needs in some areas. In Iowa, eight additional livestock auction markets were reported under supervision of the Des Moines office. The Chicago fruit and vegetable terminal market office added shipping point reports on ornamental crops in Illinois to its other duties. The Madison, Wis., dairy and poultry market news office expanded its report on dry milk products to cover the entire Midwest.

The use of automatic telephone answering devices which make reports available to callers 24 hours a day was increased last year. Livestock market news offices, with automatic telephone answering devices at 72 points in 28 States, received about 23,000 calls a week in 1973. Fruit and vegetable, and dairy and poultry market news offices added 16 automatic answering devices in 1973 to their 1972 total. In many instances, the cost of the devices is assumed by commercial interests rather than by the Government.

Market news reporters also increased dissemination of market news through television as well as radio broadcasts and by obtaining greater newspaper coverage of market reports. Radio stations, for example, recognized the need of producers and marketers for this Government-provided impartial information by providing a 50-percent increase in the number of livestock market news broadcasts alone.

Informing buyers and sellers of changes in marketing is essential to the task of market news. This was accomplished not only by providing additional area coverage but also by adding special reports. New reports provided in 1973 included the following:

- A national sheep summary produced daily and weekly in San Angelo, Texas.
- Weekly shipments of grain by barge in the Mississippi Basin.
- "National Dairy Market At a Glance," a summary added to all dairy reports.
- A price report on processed canner fowl in the Southeast to reflect the fact that most all light, ready-to-cook hens move to canners and that only heavier types go to consumers.

## Egg Products Inspection Program

Under the Egg Products Inspection Act, AMS provides mandatory inspection of all plants processing liquid, dried, or frozen egg products, which most large manufacturers use to make cakes and other prepared products containing eggs. It also controls the disposition of restricted shell eggs. These are eggs that might contain harmful bacteria.

In 1973, AMS inspected 613 million pounds of liquid egg products and 67 million pounds of dried egg products in 150 processing plants. AMS and cooperating State agencies also registered 6,815 egg handlers and hatcheries, and made 25,000 inspection visits to assure that restricted shell eggs were properly disposed of. And, as part of the inspection of egg products, laboratory technicians analyzed samples of liquid and dried eggs for 12 pesticides and other possible contaminants.

Using its expertise in inspecting eggs and egg products to help APHIS safeguard against spread of the Exotic Newcastle disease in poultry, AMS also supervised the movement and processing of 84,000 cases (30 dozen to a case) of imported eggs.

### Marketing Agreements and Orders

The Federal milk order program, which helps assure market stability and an adequate supply of milk by providing for minimum prices to dairy farmers, covered 61 marketing areas, where about 70 percent of the Nation's people lived in 1973.

Forty-nine marketing agreement and order programs for fruits, vegetables, and specialty crops like nuts, hops, and dates helped producers of these commodities cope with marketing problems. Value of commodities covered by these programs totaled more than $2.5 billion at the farm level.

USDA cooperated with the Cost of Living Council in preparing and reviewing regulations issued under all marketing orders to see that they conformed not only to the legal objective of income stability, but helped to provide price stability to consumers as well by encouraging marketing of more food during periods of shortages.

### Market Research and Promotion

Breakthroughs were recorded during 1973 in several areas of research under a producer-supported cotton research and promotion program monitored by the Agricultural Marketing Service. One joint research project financed by cotton producers and State and Federal agencies showed that cotton's number one enemy, the boll weevil, can be stamped out. Another project has produced a pollution-free way to control and possibly eradicate the pink bollworm, the most destructive cotton pest in the Far Western States.

Other important research projects included the study of new mechanical systems for handling, storing, transporting, and ginning of seed cotton; intensified investigation of all aspects of byssinosis, the brown lung disease affecting textile workers; and research on flame retardance in children's sleepwear and durable press fabrics. These products are carried out under the Cotton Research and Promotion Act and the Agricultural Act of 1970 to improve the competitive position of cotton and increase its markets.

Meanwhile, the Potato Research and Promotion Plan concluded its first year of operation in 1973, with initial emphasis directed toward publicizing the high nutrition-low calorie attributes of potatoes. This program is supported by an assessment of 1 cent per hundredweight on potatoes used for human consumption and seed. Producers not wishing to support the program may obtain a refund of their contribution.

Under the Wheat Research and Promotion Program, carried out cooperatively by the Agricultural Marketing Service and the National Wheat Institute, several projects to expand the market for U.S. wheat were approved and implemented during 1973. These projects, financed by funds remaining from 1968 sales of export marketing certificates not claimed by wheat producers and authorized by a 1970 act of Congress, will use about a third of the $2 million total budget for the program.

### Plant Variety Protection

The first 20 certificates of protection were issued to developers of new varieties of seed-borne plants under the Plant Variety Protection Act of 1970. The Act encourages the development of new varieties of plants by awarding developers exclusive rights of reproduction and sale. The new varieties are expected to produce more and better food, feed, and fiber for the benefit of the U.S. farmer, consumer, and needy people in all parts of the world. A quarterly journal started during the year by the Agricultural Marketing Service lists applications for and grants of protection.

Regulatory Programs

In connection with the administration of the Federal Seed Act, a truth-in-labeling law, the Agricultural Marketing Service sponsored regional soybean seed workshops to help seedsmen and seed analysts handle germination problems that had resulted from adverse harvest conditions in certain regions of the country, and thus improve the quality of soybean seed going to farmers. Growers and marketers of fresh and frozen fruits and vegetables continued to benefit from protection afforded under the Perishable Agricultural Commodities Act, as reparations totaling $1.6 million were awarded aggrieved parties and informal settlements of other disputes resulted in payments of about $3.6 million. In the largest of about 2,800 settlements under the Act, AMS helped Maine potato growers collect more than $1/2 million a large processor had failed to pay them for potatoes.

USDA assisted the Department of Justice in the successful prosecution of the first court case concerned with violation of the Agricultural Fair Practices Act in 1973. The defendant, a live poultry dealer charged with discrimination against members of a poultry growers' association, while not admitting violation of the Agricultural Fair Practices Act and the Packers and Stockyards Act, consented to a Federal court decree. This permanently enjoined the firm from terminating or refusing to enter into broiler-growing contracts with any grower because of activities or membership in a producers' cooperative. A second court case involving another poultry dealer was successfully terminated, and a third involving a milk handler was still in litigation at the end of 1973.

Transportation and Warehouse Services

With intercity transportation accounting for about 8 percent of the Nation's total cost of marketing farm products, AMS approached the Interstate Commerce Commission (ICC) several times to head off increases or to reduce existing transportation rates for farmers. Savings to North Dakota farmers, for instance, totaled an estimated $12 million per year in reduced freight costs.

Early in 1973, severe drought in parts of the Pacific Northwest caused critical deficits of pasture, forage crops, and other livestock feed supplies. In response to requests from the Governors of these States, AMS asked the ICC to issue drought orders which would permit the railroads to reduce their rates on hay. Four orders subsequently issued resulted in rate cuts by as much as 50 percent for 4 counties in Idaho, 20 counties in Montana, 10 counties in Oregon, and 5 counties in Washington.

In addition, AMS established a railcar monitoring system, in an attempt to help alleviate the national shortage of railcars available to move the 1973 grain crop. The monitoring system helped pinpoint areas of the country where transportation was needed. The information gathered was passed to the ICC, U.S. Department of Transportation, and railroad associations for action in redistributing the cars in the most efficient manner.

Under its program of voluntary warehouse examination, AMS inspected some 1,400 licensed grain warehouses and 320 licensed cotton warehouses. This program covers about 40 percent of the public grain storage capacity and about 62 percent of the cotton storage capacity in this country.

Section 32 Programs

Because of the disappearance of chronic surpluses of farm products and the need to curtail Federal expenditures, USDA's monthly Plentiful Foods List was discontinued in August of 1973. The Agricultural Marketing Service has reorganized the program to save money and to respond well when any food commodities are in overabundant supply and have difficulty clearing their market. During the late fall and holiday period, for instance, communications media and food trades were encouraged to use and direct consumers' attention to cranberry products which afforded relatively good consumer value because of greater than usual supplies.

As another means of relieving economic pressures exerted on producers, USDA, with funds authorized by Section 32 of P.L. 74-320 (August 24, 1935), purchased 665 million pounds of food at a cost of $181 million in fiscal 1973. Commodities purchased help improve the diets of school children and needy persons. Two products, frankfurters and ground turkey, were added to the extensive list of commodities purchased and then distributed through USDA's direct food distribution programs.

## Animal and Plant Health Inspection Service

As a result of Animal and Plant Health Inspection Service (APHIS) programs during 1973–

- Family shoppers can check quickly on the lean-fat content of bacon before they buy it.
- A 1-ounce batch of gypsy moth eggs circled the globe every 90 minutes for 87 days in zero gravity.
- Over 60 million pieces of luggage were inspected, and about 21.7 million passengers in plane and ship travel were processed through an inspection program.
- The first criminal convictions were obtained for cruel and inhumane treatment of horses to develop special show gaits.

Federal Meat and Poultry Inspection

Consumers continue to express concern for nutritional labeling, guidelines for convenience foods, open dating, percentage labeling, and improved packaging. In response, Federal meat inspection regulations were revised to require bacon packages with a window that shows at least 70 percent of a representative slice of bacon. The new packages began appearing on the shelves in the fall.

New labeling regulations for hot dogs and other cooked sausage, effective January 1, 1974, permit three types of frankfurters: (1) Those made only from skeletal meat, (2) those made with meat byproducts, and (3) those which also include nonmeat binders such as nonfat dry milk. All three must be labeled to convey appropriate information about the content.

A change in food labeling regulations establishing a voluntary, uniform "open dating" system has been proposed. Purpose of the change would be to enable consumers to check the label for clearly understandable information about the freshness of meat and poultry products. The package label would list the packing date, the "sell-by" date, or the "use-by" date.

Another proposal calls for a new system to provide uniform labeling requirements for net weights on meat and poultry products. It would prescribe uniform procedures for checking the net weights, from processor to retailer levels.

### Coordination of Federal and State Inspection

Under existing legislation, Federal meat and poultry inspection is required for products moving in interstate commerce. Products processed and sold within State boundaries are subject to State inspection, as long as the system can be certified as "equal to" Federal requirements.

As of June 30, 1973, meat inspection systems in 41 States and poultry inspection systems in 32 States were certified equal to Federal requirements. Meat plants selling their products only in intrastate commerce in Missouri, Oregon, Pennsylvania, and Washington were placed under Federal inspection during fiscal 1973. Intrastate poultry plants moved under Federal inspection in Missouri and Washington.

By the end of fiscal 1973, some 3,948 meat plants, 679 poultry plants, and 1,141 combination plants were operating under Federal inspection. During that year, APHIS inspectors examined 90.1 billion pounds of meat and meat products and 30.7 billion pounds of poultry and poultry products. Some of the total represents meat or poultry counted more than once because these products are inspected at various stages of processing to help assure a clean, safe food supply.

Meat and poultry products found to be unwholesome, adulterated, or mislabeled are kept out of the food supply. Federal inspectors during 1973 condemned 86 million head of poultry and 391,000 meat animals, 12 million parts of meat animals, 37 million pounds of processed meat products, and 31 million pounds of processed poultry products.

As a second line of defense against unfit products in consumer marketing channels, APHIS compliance officers detained approximately 15 million pounds of suspect meat and poultry in 653 actions during fiscal 1973 to prevent fraudulent or illegal practices once the product left the processing plant.

APHIS has stepped up its laboratory monitoring to guard against meat and poultry contaminants from such sources as antibiotics, growth stimulants, and pesticides. During 1973, the Food and Drug Administration banned all uses of diethylstilbestrol (DES) as a growth promotant, significantly increasing the number of tissue samples analyzed in APHIS laboratories.

Standards for product composition and labeling requirements are important phases of the inspection system. During the fiscal year, APHIS labeling specialists examined for accuracy and completeness 177,309 label designs submitted for required advance approval. Of these, 141 were rejected and 15,139 were sent back for changes so they would not confuse or mislead consumers.

### Foreign Inspection Systems

During the year, 1,077 specific plants in foreign countries were certified to export meat or poultry to the United States. A staff of 19 foreign programs officers from APHIS made 3,110 visits to certified plants. APHIS is working toward visiting major exporting plants at least four times a year.

During 1973, APHIS checked the meat inspection program of Belize (formerly British Honduras, Central America) and the country was declared eligible to export to the United States. This brought to 46 the number of countries eligible to export meat to this country and to 3 the number eligible to export their poultry products.

### Plant Protection and Quarantine

The gypsy moth eggs exposed to weightlessness in space are part of a cooperative experiment by APHIS, the Agricultural Research Service, and the National Aeronautics and Space Administration. The eggs were furnished by APHIS and taken to Skylab by three astronauts for an 87-day trip in zero gravity. The objective is to see what effect prolonged weightlessness has on diapause, the hibernation characteristic of some types of insects.

Previous Skylab experiments demonstrated intracellular redistribution in test organisms at zero gravity. If a similar phenomenon occurs in the embryo brain cells of gypsy moth eggs, it might cause the normal 150- to 180-day diapause to end sooner. Understanding the mechanism to terminate diapause artificially could lead to improved techniques for research and better control of gypsy moth and certain other insects.

*Gypsy Moth Control Program.* During the summer of 1973, gypsy moth caterpillars defoliated about 1,774,000 acres of woodland in nine Northeastern States. In addition, they were found in 15 other States outside the infested region.

Presence of the insects is detected by a trapping program conducted by APHIS in cooperation with State agricultural agencies and volunteers from the National Campers and Hikers Association (NCHA). Through the program, a total of 63,354 traps were placed to detect gypsy moth spread and population buildup. Trapping results add information to guide future quarantine, survey, and control measures.

Participation by NCHA volunteers provided a service that would have cost the taxpayers more than $100,000 if performed by government employees.

*Cereal Leaf Beetles.* During the year, APHIS released 850,000 tiny wasps as part of an eight-State biological program to control cereal leaf beetles, a serious pest of small grain crops. States in the program are Indiana, Kentucky, Michigan, New York, Ohio, Pennsylvania, Virginia, and West Virginia.

APHIS, in cooperation with the Agricultural Research Service, went to the beetle's European homelands in search of its natural enemies and found the wasps, which are about the size of a pinhead. Though natural enemies of the cereal leaf beetle, they are harmless to man, animals, and other insects found in the United States.

Under a cooperative State-Federal agreement, wasps are being reared in laboratories and field insectaries for release each summer throughout infested areas. The wasps have been forming colonies successfully and appear to be spreading naturally as biological controls.

*Grasshopper Treatments.* In a program aimed at protecting grasslands to grow beef, APHIS completed aerial spraying to control grasshoppers on nearly 3 million acres of rangeland in nine Western States during the year. States included in the control program were California, Colorado, Idaho, Nevada, New Mexico, Oregon, Texas, Washington, and Wyoming. Treatments began June 6, after Federal-State survey teams found grasshopper infestations as high as 50 per square yard in parts of southeastern Washington. Populations of eight or more grasshoppers per square yard are considered sufficiently destructive to require treatment.

*Pink Bollworm Control.* APHIS released some 90 million sterile pink bollworm moths in cotton-growing areas of California's San Joachin Valley during 1973.

Large-scale release of sterile moths was begun in 1968 to prevent this most destructive of all cotton insects from gaining a foothold in the valley. The insects are reared, sterilized, and shipped from an APHIS facility in Phoenix, Arizona.

When sterile and native bollworms mate, less than 3 percent of the eggs produced will hatch. Of those that do hatch, none of the adults are fertile.

As a result of the current program, the San Joachin Valley, which produces about 90 percent of California's cotton, is the only major cotton-growing area west of the Mississippi River not generally infested with the pests.

So far, the only infested areas east of the Mississippi are the Florida Keys and the Everglades. In November 1973, APHIS began relasing about 2 million sterile moths each week in infested areas of southern Florida. The object was to prevent spread of the pink bollworm to valuable cotton-producing areas in other Southeastern States.

### Agricultural Inspection and Quarantine

Protection starts at the borders and ports of entry to keep out pests and diseases from other countries. During 1973, inspection and quarantine activities for air travel included the inspection of approximately 326,000 planes, nearly 56 million pieces of luggage, more than 3.8 billion pieces of air cargo, and the processing of approximately 20 million passengers. In addition, nearly 78,000 ships—both cargo and passenger—were inspected. Approximately 4 million pieces of ship's baggage were inspected and more than 1.3 million ship's passengers were processed.

Mexican border activities included the inspection of about 41 million vehicles, 7.3 million pieces of baggage, 36.8 million hand-carried packages, and 75,000 railroad cars. Of the nearly 70 million packages of incoming foreign mail, about 37,000 packages were opened for agricultural inspection.

As a result of these activities, a total of 35,193 plant pests of economic significance to agriculture were intercepted. Without this frontline barrier of inspection service, these pests could now be preying upon the U.S. agricultural economy.

### Veterinary Services

Under the Horse Protection Act, criminal cases against 51 horse trainers and owners were filed in U.S. courts during the year. At the end of December, 11 defendants had been convicted and fined, 5 had charges dropped or were acquitted, and charges were still pending against 38 others.

The purpose of the law is to prevent, in attempts to avoid the proper training periods and breeding programs, the cruel and inhumane treatment of "soring" Tennessee Walking Horses to achieve the desired high-stepping gait for the show ring.

### Animal Dealers, Exhibitors, and Research Facilities Listed

Under the Animal Welfare Act, APHIS has licensed or registered 4,450 animal dealers, 890 exhibitors, and 894 research facilities using animals in research. Regulations of the Act set standards for housing, feeding, watering, adequate veterinary care, and humane handling of animals; sanitation, ventilation, and protection of facilities from inclement weather; and separation of incompatible animals. The law covers dogs, cats, hamsters, monkeys, rabbits, guinea pigs, and most other warm-blooded animals used in research, exhibited in zoos or circuses, and sold as pets.

## Animal Disease Control and Eradication

A massive outbreak of Exotic Newcastle disease, starting among poultry in southern California in November 1971, was wiped out during 1973. Eradication efforts required the destruction of 11.5 million birds, extensive quarantines, vaccination programs, and surveillance activities. The operation cost about $48 million.

The last area quarantine involving this outbreak was lifted August 30, 1973, and the last flock quarantine November 2, 1973. Surveillance will continue for at least 6 months to be sure the disease has been eradicated. Several isolated cases of Exotic Newcastle disease introduced in other parts of the country were eliminated without any spread of the infection.

During 1973 only 16 swine herds were found to be infected with hog cholera, compared to 205 in 1972. All of the 16 herds were discovered before July of that year. The 6 months since that time is the longest known period without a case of hog cholera since the disease was first recognized in the United States in the early 1830's. An estimated 5,000 to 6,000 swine herds were infected annually before the national eradication campaign began in late 1962.

In January 1973, the United States was officially declared free of sheep scabies, a disease which APHIS and cooperating States had been fighting through an intensive campaign for 12 years. The last case of scabies was discovered in January 1970. Eradication of the mites which cause this disease will save the nation $17 million a year.

*Battle Continues Against Animal Disease.* The APHIS battle against screwworms in the Southwest during 1973 included both successes and setbacks. It was a good year when the 15,000 screwworm cases recorded are compared with the more than 95,000 cases reported in 1972. But the 1973 total was still far above the normal level of cases during the 10-year history of the southwestern eradication program.

Work continued during the year on getting the joint U.S.-Mexican screwworm eradication program underway. The program is aimed at pushing the screwworm barrier zone southward from the U.S.-Mexico border to the Isthmus of Tehuantepec in southern Mexico. Achieving this objective will prevent future invasions of screwworms into the United States.

During 1973, Montana became the 30th State to qualify as a "certified brucellosis-free" area, yet the number of brucellosis-infected cattle herds increased in some areas, particularly the Southeastern and South Central States. APHIS officials are calling for stepped-up efforts to reverse this trend.

A campaign against a serious outbreak of cattle scabies in Southwestern and Midwestern States continued during 1973. Some 48 infected herds in 10 States were treated. In 1972, cattle scabies was found in 79 herds in seven States.

APHIS also continued to battle an outbreak of cattle fever ticks around Alice, Texas. In July 1973, the cattle fever tick buffer zone along the Rio Grande was enlarged to include new infestations that had occurred farther north in Texas. Dipping and inspection of animals continue.

For the second year in a row, there were no cases of Venezuelan equine encephalitis (VEE)—the horse sleeping sickness that invaded 26 counties in south Texas during the summer of 1971.

APHIS will continue surveillance and is urging horse owners to have their animals vaccinated for VEE.

APHIS enforces the Virus-Serum-Toxin Act of 1913, designed to ensure that animal vaccines and other veterinary biologics are safe, pure, and effective. Continued surveillance and testing of veterinary biologics kept nearly 242 million doses of unsatisfactory products off the market during 1973.

**Commodity Exchange Authority**

For the fifth consecutive year, volume of futures trading in regulated agricultural commodities reached an alltime record. Futures transactions during the year for 20 commodities totaled 18.6 million contracts and were valued at $329.1 billion. Comparable figures for the year before were 14.3 million contracts and $181.3 billion.

The Commodity Exchange Authority (CEA) requested that the Citrus Associates of the New York Cotton Exchange extend the trading period and the delivery period in the July 1973 frozen concentrated orange juice futures contract to insure an orderly liquidation. The request was made so that the futures market would have an opportunity to adjust to any changes in phase IV of the President's wage and price control program. Preventive actions to insure orderly markets were also taken on soybeans, soybean meal, cotton, and pork belly futures during the year.

Underwriting, issuing, or otherwise assuming financial responsibility for "puts" and "calls" transactions in nonregulated commodities by regulated futures commission merchants were banned effective January 2, 1974, as the result of a new regulation issued by CEA. However, the regulated futures commission merchants will still be able to serve as brokers on "puts" and "calls;" that is, they may find buyers or sellers to take the opposite side of their clients' option transactions.

New Responsibility

Under revised CEA regulations, contract markets took over responsibility for collecting and publishing daily commodity trading information January 1, 1974. The revised regulations require contract markets to report to CEA the daily volume of commodity trading and open contract data. Contract markets will also be required to publish volume of trading and open contract information each day.

Under the Commodity Exchange Act, the Pacific Commodities Exchange, Inc., of San Francisco, Calif., was designated as a contract market for shell eggs, effective February 9, 1973, and for live cattle, effective October 19, 1973. The Mid-America Commodity Exchange of Chicago, Ill., was designated as a contract market for live hogs, effective September 14, 1973.

In 1973, CEA published a survey report entitled "Trading in Commodity Futures Contracts on the Chicago Board of Trade—A Study of the Sources and Distribution of Volume of Trading and Commission Income." This was the first survey report of its kind by this agency. CEA also published a 51-page booklet entitled "Federal Regulation of Trading in Commodity Futures Contracts." This publication gives answers to a number of questions often asked CEA about the regulation of commodity futures trading.

Record Markets Emerge

Record futures markets emerged in most commodities in 1973. In the grain markets, trade in corn reached an estimated 20.9 billion bushels (4.2 million contracts), more than doubling the 9.8 billion bushels (2.0 million contracts) traded in 1972. The oats market showed a sevenfold increase with an estimated 1.4 billion bushels traded, as compared to the 0.2 billion bushels traded in 1972. Wheat volume, the largest in 6 years, increased from 6.4 billion bushels traded in the previous year to 10.8 billion bushels.

The 1973 volume of soybeans totaled 14.0 billion bushels, a decline of 32 percent from the record volume of 20.6 billion bushels traded in 1972. Trade in soybean oil resulted in 1,763,059 contracts, an increase of 59 percent over the 1,110,829 contracts of the previous year. Volume of soybean meal increased 5 percent (660,506 contracts compared to 631,117 contracts in 1972).

In the livestock and livestock products group, trade in cattle futures was estimated at a record 2,579,233 contracts. This represented an 87-percent increase over the 1,378,255 contracts of 1972. Volume of trade in live hogs, following the pattern for cattle, rose substantially and set a new record. In 1973 contracts totaled 1,060, 892, an increase of 96 percent over the 542,331 contracts traded in the previous year. The frozen pork belly market, one of the leading commodity markets for the past several years, showed a decline in 1973 with a volume of 1,159,369 contracts, down 44 percent from the near-record trading volume of 2,058,620 contracts in 1972.

Other commodity markets with active trading follow:

- Potatoes, with a record volume of 686,191 contracts, compared to previous-year volume of 253,376 contracts.
- Eggs, with a 1973 volume of 620,962 contracts, up 30 percent from the previous year.
- Cotton continued its recent growth, with a volume of 450,471 contracts, compared to the 1972 volume of 365,665 contracts.
- Wool increased to 4,678 contracts; 3,772 contracts were traded the previous year.
- Frozen concentrated orange juice showed a slight increase in 1973; some 151,828 contracts were traded compared to the 123,683 contracts in 1972.
- Coconut oil, traded for the first time last year, had a volume of 12,742 contracts in 1973.

Other small but gorwing markets included grain sorghums and frozen boneless beef.

## Food and Nutrition Service

In 1973, evidence that the national goal of ending poverty-related hunger was being attained mounted. Participation in the needy family food programs and in the free-price feature of the school feeding program leveled off after 4 years of rapidly increasing response to Federal-State expansion and outreach efforts. Attainment of this growth plateau in the past 12 months indicates that the programs are effectively reaching Americans in financial need of food assistance.

Food Stamp Program

The prime means for getting food to needy families is through the Food Stamp Program, under which eligible households are given a Federal food-buying bonus. Significant actions in 1973 helped participants to meet rising food costs and enabled them to enjoy a wider selection of food for more adequate diets.

Food stamp coupon allotments were increased in mid-1973 and again on January 1, 1974. Henceforth, under legislative provisions of the Agriculture and Consumer Protection Act of 1973 (Public Law 93-86), enacted in August, food stamp eligibility levels, purchase requirements, and bonuses will be appraised twice each year to keep the program current with national cost-of-living fluctuations.

As 1974 began, a family of four people, for example, with a monthly income of $473 or less (after allowing certain deductions) could be eligible for the program. Geared to USDA's economy food plan, the food stamp allotment for such a family was $142 per month. The amount of money required to be paid by four-person households ranged from zero dollars for those at minimal income levels up to a maximum of $118 for those with incomes at or near the top of the eligibility limit.

*Other Improvements.* Other important legislation related to the Food Stamp Program in 1973 provided for—

- A new definition of "eligible foods" that may be bought with food coupons—to include imported foods and seeds and plants to be used to grow food in home gardens.
- The elderly to use food coupons to buy meals served in nonprofit facilities where meals are prepared especially for older people.
- Broadened eligibility to include the elderly in congregate housing, and drug addicts and alcoholics under treatment or rehabilitation programs in non-governmental, nonprofit resident facilities.
- Issuance of coupon allotments at least twice a month, and optional withholding of purchase requirement for recipients of Aid for Families with Dependent Children.
- Retention of food stamp eligibility for Supplemental Security Income recipients if total benefits effective January 1, 1974, are less than the sum of December 1973 welfare benefits plus current food stamp bonuses.
- Program extension nationwide by June 30, 1974, except in areas where the State agency can demonstrate it is "impossible or impracticable."

Steps were taken to assure that persons not eligible for the program were denied participation so that full benefits of the program can be made available exclusively to those qualified.

*More People Served.* As a result of wider program availability and higher income eligibility limits, the Food Stamp Program served an average of 12.4 million people per month last year, about 700,000 more than the 1972 average. Studies and observations by the Food and Nutrition service indicate that the number of people benefiting from the Food Stamp Program at one time or another during the year was probably substantially greater than the monthly average of 12.4 million.

## Food Donations

The companion family food assistance effort, under which foods acquired by USDA under price-support and surplus-removal authorities are donated directly to eligible people, was maintained in those areas of the country not yet enrolled in the Food Stamp Program. Participation averaged 2.4 million per month in 1973. In total, then, an average of some 14.8 million Americans took part in the Federal-State family food assistance activities each month last year.

In December 1973, Food Stamp Programs were operating in some 2,533 U.S. counties and independent cities. Food donations served families in another 530 counties and cities, of which over 400 jurisdictions were already in the process of shifting to food stamps.

### Pilot Study Program

A total of 216 areas in 45 States, Puerto Rico, and the Virgin Islands were named in late 1973 to take part in a pilot study program that will provide special supplemental foods to new and expectant mothers and their infants and children under 4 years of age. The pilot program is being operated by local health agencies with cash grants from the Food and Nutrition Service to evaluate medically the role of food in combating physical and mental damage that may affect malnourished infants. It is authorized to run through June 30, 1975.

### Child Nutrition Programs

The National School Lunch Program continued in 1973 to be the principal public vehicle for improving the nutrition of children, as it has been since 1946.

There was progress toward making the program available to all school children and in boosting student participation in the majority of schools already in the program. Concerned organizations such as the American Legion, U.S. Jaycees, U.S. Catholic Conference, the Women's Auxiliary of the American Medical Association, the Council for American Private Education and the Women's Clubs of America worked at local levels to encourage more schools to start food services.

At the end of 1973, the federally assisted lunch program was available to some 44 million children, or about 86 percent of the Nation's 51 million enrollees in public and private schools. Nearly 60 percent of the children in program schools participated in the lunch during the year, with a peak of 8.8 million of them receiving free or reduced-price lunches under national income eligibility standards.

More children became eligible for reduced-price lunches as a result of legislation enacted in November 1973, which authorized States to serve such lunches to children from families with incomes up to 75 percent higher than the minimum income guideline for free lunch eligibility. Previously, the cutoff level for the participant was 50 percent above the free lunch minimum.

Under the November legislation, the national average Federal payment to help schools defray food costs for all lunches served increased from 8 to 10 cents, effective retroactively to the beginning of the 1973-74 school year. In addition, States were guaranteed an average of 45 cents for each free lunch served to needy children and 35 cents for each reduced-price meal. The basic Federal support payments for both school lunches and breakfasts will be adjusted twice each year in line with cost-of-living economic factors.

Extending beyond school lunches and breakfasts, programs were strengthened to bolster the nutrition of children through the Special Milk Program and through summer and year-round Special Food Services for children in vacation recreation programs and day-care centers.

All of the States, the District of Columbia, and five territories will share in at least $1.224 billion of Federal funds for all child nutrition programs in fiscal year 1974, about 16 percent more than was used in fiscal year 1973.

### Food Distribution

The soaring demands for food at home and abroad in 1973 were reflected in procurement problems encountered by the U.S. Department of Agriculture in its purchase and distribution programs that normally supply about 20 percent of the value of all foods used in school food services.

Congress granted authority to the Food and Nutrition Service to provide special cash payments to the States to make up the difference between amounts budgeted for donated foods for schools and the value of actual deliveries, if USDA is unable to buy and distribute amounts anticipated. In April 1973, nearly $71 million in cash was distributed to the States, representing the "shortfall" in amounts initially programmed for delivery in the 1972-73 school year. Legislation enacted in August made permanent the cash payment authority, and at the same time broadened USDA's authority to use surplus-removal and price-support funds to maintain annual budgeted levels of assistance for schools, domestic relief distribution, and other domestic food programs.

For the 1973-74 school year, the value of USDA donations of food for schools is budgeted at nearly $314 million, a sum to be used largely for poultry and dairy products, meats, grains, oils, and fruits and vegetables. More than half of that amount—some $166 million—had been purchased by the end of December 1973.

### Packers and Stockyards Administration

The Packers and Stockyards Administration (P&SA) obtained a cease and desist order in 1973 against eight New York meat packers. This order requested them to stop restricting competition in the purchase of veal calves and allocating sales of carcasses. Separate charges of violating fair trade practices and restricting competition in the purchase of veal calves were filed against a California packer and two livestock dealers. The respondents were charged with entering into an agreement not to bid against one another for calves. The packing industry was reminded that meat packing firms feeding livestock on a custom basis or selling livestock to other packers may face charges of violating the Packers and Stockyards Act. It was noted that there is a great potential for manipulation of markets and restriction of competition in such situations.

The agency also began a program of registering and bonding custom feedlot operators who furnish market agency or dealer services. A policy statement setting forth guidelines for advertising and promotional allowances by meat packers was published. The guidelines establish that all competing customers of a packer should receive proportionally equal treatment in such allowances.

Meanwhile, a report concerning marketing problems in the lamb industry, published jointly by P&SA and the Economic Research Service, indicated that the ranking buyer purchased more than half of the milk-fat lambs in at least 15 major marketing areas during the study period. In about half of the marketing areas, the ranking buyer purchased from one-third to one-half of the available fed lambs. The study said that such concentrated buying power can cause buyers to dictate the terms of trade and to impose unfavorable discount systems on the sellers.

As a result of charges brought against them under the P&S Act and the Agricultural Fair Practices Act, two poultry processing firms were ordered in U.S. District Court to stop discriminating against poultry farmers who were members of a poultry growers' association. In another case, a U.S. District Court ordered a poultry dealer who had made a retroactive cut in his pay rate schedule to pay $26,495 to 108 contract broiler growers.

The U.S. Supreme Court, reversing an earlier decision by a court of appeals, ruled that the Secretary of Agriculture has full authority to suspend a registrant violating the Packers and Stockyards Act. The Court said that suspension of the stockyard operator, who had ignored earlier warnings against short-weighing livestock, was not an abuse of the administrative discretion.

An amendment to the bonding regulations of the P&S Act was adopted. The amendment requires that claims against a registrant's bond be filed no later than 120 days after a transaction takes place. The time for filling such claims is now limited only by laws within the individual States. This has resulted in some claims being filed several years after a given transaction, and, in turn, in slower final payment of all valid claims against the bond.

The Seventh Circuit Court of Appeals upheld the right of USDA to subpoena a packer's business records during investigation of possible violations of the Packers and Stockyards Act. The packer firm had appealed an earlier U.S. District Court order to produce the records on the grounds that this was an infringement of its rights under the fourth amendment to be free from unreasonable search and seizure.

### Farmers Home Administration

The progress of recent years in expanding rural credit services continued in 1973. Large amounts of capital are now flowing into rural areas where family-farm agriculture, housing, community modernization, and new business development have languished in the past for lack of adequate financial resources.

The Farmers Home Administration (FHA) is the main channel of federally guaranteed credit for all these purposes.

FHA's lending services are conducted with funds from private sources. Rather than dealing in direct Government loans, the agency provides an access route through which private capital can reach out from regional and national centers of finance to farms, homes, and communities of the countryside.

Loans are made through some 1,700 local FHA county offices where the service is convenient to rural people and organizations. However, more than 99 percent of the money advanced is supplied by private institutions and individuals, either through federally guaranteed investment securities or through the agency's guarantee against loss for the lender who serves a rural borrower.

Loans for Improvement

In 1973, FHA provided a record $3.3 billion through more than 276,318 loans to individuals, organizations, and communities for ownership and operation of farms, for town and country housing, for water and waste disposal systems in rural towns and countryside, and for other projects to improve the conservation and use of land and water.

In addition, authorizations conferred by the Rural Development Act of 1972 added two important new categories to the variety of FHA loan services. The programs inaugurated late in 1973 provide loans for businesses and industries in rural areas, including pivotal towns of up to 50,000 population, and for public facilities, such as fire stations and community centers, in towns of up to 10,000.

In farm credit, a significant and widely accepted new program of youth loans also was started. Young people, such as 4-H Club and Future Farmers of America members, may borrow on their own responsibility from FHA, even though under the age of legal majority, to finance income-producing projects related to their school or organization programs. Youth loans may be made for nonagricultural income-producing projects associated with school or club activity that enable the youthful entrepreneur to gain business experience as well as earn money.

USDA Helps Channel Rural Development Capital

With these new authorities added to existing programs of FHA and Rural Electrification Administration, USDA assumed its mission as the Federal department of primary responsibility in rural development, prepared to help channel necessary capital resources into the effort.

For fiscal year 1974, the two agencies had between them $4.5 billion of loan authority, supplementing other credit available to rural families and communities.

In its program objectives, the Farmers Home Administration emphasized attention to rural credit requirements in four essential areas:

- Increased farm production to meet urgent domestic and export demands, including the renewed use of some 40 million acres of land that had been held out of production.

- Rural development's requirement of a broader base of modernized community facilities, such as water systems, sewer systems, and fire protection.
- More business and industrial development to augment agriculture as a source of livelihood in rural areas.
- More adequate housing for the Nation's rural population.

Projects assisted by the agency must measure up to all applicable State, regional, or local comprehensive planning, health standards, and economic objectives.

### Farmer Programs

Farm loan services of FHA added nearly $1.9 billion to the Nation's supply of operating capital for agriculture in 1973. They were especially significant as a source of credit for beginning farmers and for other capable farm families having not yet established conventional credit. FHA itself dispensed $1.3 billion of farm credit, and its services generated over $500 million more from other lenders.

The Verl M. Buxton family of Cache County, Utah, exemplified the potential value of an opportunity extended through FHA. Raised on a farm, Mr. Buxton began work as a carpenter but in spare time built a house of his own. In 1954 he sold the house for enough to get possession of 70 acres of poorly improved land near Cornish, Utah. As they began the effort to make their farm productive, the Buxtons had loan assistance from FHA to underwrite improvements and operations.

Nineteen years later, having "graduated" from FHA credit to conventional financing through diligent work, good farming methods, and good management, they have built one of the fine one-family dairy farms of the country.

The Buxtons also are raising and educating a family of five children and have been invaluable citizens of the Cornish community, where Mr. Buxton has served as mayor. In July 1973 at the White House, the Buxtons were recognized by the President as national "Farm Family of the Year."

Many who may emulate the Buxtons were among 52,000 families who received regular FHA farm operating loans totaling more than $471 million and nearly 14,000 who received farm ownership loans totaling $386 million in 1973. In addition, other lenders supplied more than $500 million of credit to farmers and ranchers whose needs were served jointly by FHA and cooperating lenders.

About $11 million was loaned by FHA for other purposes beneficial to agriculture, including irrigation and land drainage projects, association grazing areas, return of scattered parcels of land to tribal control on Indian reservations, farm-based recreation enterprises, and soil and water conservation improvements. Emergency loans supplied another $491 million to help restore more than 115,000 farms affected by recent natural disasters.

### Community Development

The program to provide modernized, central water and sewage disposal services to rural towns and the countryside has been a widely supported and growing activity of FHA for more than a decade. Last year loans exceeding $442.5 million were approved for about 1,400 additional systems, ranging in coverage from local neighborhoods to multicounty areas.

While most grant functions were transferred from FHA to other agencies, the loan program continues to rise to new record volume with each succeeding year. More than 8,000 systems have been created since the beginning in the late 1950's. Many of the older systems have undergone one or more expansions, signifying their positive effect on growth and improvement in living standards for their service area.

Denver and New York City are among metropolitan centers whose water supply will be cleaner because small-town sewer systems, financed through the rural program, have checked pollution of rivers that contribute to the cities' sources of supply.

On December 20, 1973, the extension of FHA assistance to other kinds of rural community facilities was signaled with announcement of a project in Troy, Tex. (pop. 600): A loan of $85,000 with which Troy will build a community center containing city offices, headquarters for its fire department, and a community meeting hall.

FHA public facility financing, totaling some $443 million overall during 1973, also included nearly $9 million to small watershed improvement organizations (to account for project costs that must be paid for locally) and $3.4 million to finance local contributions to projects in resource conservation and development areas.

### Business and Industrial Development

FHA's new authority to make loans, or to guarantee private lenders up to 90 percent remuneration of loss on loans, to put up businesses and industries in rural areas was also brought into operation beginning in December 1973.

A $1 million plant to make carpet padding in Calhoun, Ga., and a small machinery parts, repair, and farm supply business requiring $45,000 in Bald Knob, Ark., were the first projects approved for FHA-guaranteed loans from local and area lending authorities.

The agency's budget for fiscal year 1974 provided for $200 million of such loans by the end of the fiscal year. It included other funds for loans and grants to establish rural industrial areas with adequate utility improvements and environmental protection.

### Housing

Rural FHA housing loans insured by the Farmers Home Administration totaled nearly $1.5 billion in 1973. They provided 75,000 houses and apartment units for families of low and moderate income, including senior citizens, who otherwise would have lived in dwellings meeting less than adequate modern standards or would have been unable to find a home of any kind in a rural community.

A record authorization of $2.1 billion was budgeted for the rural housing program in fiscal year 1974. The agency's home-financing jurisdiction embraces the rural countryside and towns of up to 10,000.

### Financing and Administration

Extensive modernization of FHA operating methods was undertaken in 1973 to improve the efficiency of service in its much expanded programs.

The agency also introduced in December a new and simpler investment instrument for raising its multibillion-dollar requirement of loan funds from the public: The certificate of beneficial ownership, signifying the investor's interest in a pool of notes made to FHA by borrowers. Previously FHA placed the actual notes with investors.

## Rural Development Service

Achieving our national goal of balanced development, so that all people in this country have equal access to the jobs, facilities, services, and environmental conditions that permit a good life, is central to the Department's rural development efforts.

One of our primary instruments for helping rural Americans make their communities better places in which to live and work is the Rural Development Act of 1972, signed into law in August of that year.

The following major provisions of the Act were funded for the year beginning July 1, 1973:

| | |
|---|---|
| Title I, Section 104–Water and Sewer Loans | $470 million |
| Section 104—Community Facility Loans | 50 million |
| Section 105–Water and Waste Disposal Systems Grants | 30 million |
| Section 118—Business and Industry Loans | 200 million |
| Section 118—Development Grants | 10 million |
| Title V–Rural Development Research and Education Grants | 3 million |

### Coordination of Activities

Under the leadership of the Assistant Secretary for Rural Development, whose position was provided for in the Act, the Rural Development Service (RDS) is working to coordinate the Department's rural development activities and those of other Federal agencies into a nationwide program. Working relationships have been established with more than 90 key officials in over 80 percent of all Federal departments and independent agencies and commissions with rural development resources. More than 900 Federal domestic assistance programs have been surveyed to identify those which can contribute effectively to rural development.

Studies are also underway to identify program gaps that have an adverse effect on the Nation's total rural development efforts.

Departmental activities are being coordinated in support of nonmetropolitan planning and development agencies. The Department is working with Federal regional councils to coordinate and accomplish the better delivery of Federal programs to rural communities and areas. Staff members also represent the Department on the Interagency Economic Adjustment Committee for areas affected by military base closings.

In a further effort to provide coordinated Departmental services with maximum effectiveness to rural Americans, the Department is initiating a new program in response to the Rural Development Act's specific mandate calling for the location of all Departmental units concerned with rural development in single field offices. Local U.S. agricultural service centers will be established around the country to provide all rural residents with up-to-date, one-stop service.

### Local Leadership Development

To equip rural leaders with knowledge and expertise in the process of rural development, the Rural Development Service conducted the first national rural development leaders school in August 1973. Held in Lincoln, Nebr., the school was attended by 120 men and women from a cross-section of rural America. Two regional sessions of the school are being developed for 1974, the first to be held in March near Asheville, N.C.

Another facet of the Department's activities in 1973 to assist and encourage rural development efforts at all levels was a series of regional rural development conferences held in Pennsylvania, Tennessee, Missouri, and Nevada. The conferences brought together representatives of State rural development committees, Federal regional councils, and State governments to establish working relationships and to emphasize that the rural development role of USDA representatives in the field is one of responsiveness to State and local initiatives.

**Rural Development Program Representation**

As the focal point within the Department for overall rural development program representation, the Rural Development Service provides national organizations and government agencies at all levels with primary information on rural development.

Staff members assist national organizations representing State and local governments—such as the National Association of Counties—in understanding Rural Development Act authorities and in furthering participation in rural development activities by the State and local government units they represent. They also meet with numerous volunteer groups to encourage interest in Department programs and to explore the possibilities of cooperation.

**Research**

Rural Development Service investigations helping to provide basic research findings about human, community, and economic aspects of development in our rural areas include studies of rural population characteristics and trends in farm and nonfarm employment and identification of inadequacies in rural health care and other community services.

In one study, conducted for the Congress, it was found that commuting to urban employment centers is not a feasible option in many rural counties and for large numbers of the residents. Another study found that nearly all rural areas, despite improvement by FHA programs in the 1960's, continue to have considerable housing that is inadequate. Data show that these areas contain 68 percent of all U.S. occupied housing that lacks complete plumbing.

Other research and information materials developed include annual reports for the Congress on government services provided to rural Americans, information and technical assistance delivered by the Department, and the first report under the Rural Development Act on goals for rural development in employment, income, population, housing, and quality of community services and facilities.

### Rural Electrification Administration

Amending legislation to the Rural Electrification Act (Public Law 93-32), passed on May 11, 1973, is the first law covering both electric and telephone programs and their supplemental financing sources. Its enactment accomplished many goals and contributed toward making 1973 one of the most eventful and historic periods since the Rural Electrification Administration (REA) was created in 1935.

And Congress has been assured that "during each of the next 3 years" REA loan fund levels would not be less than the amount budgeted for fiscal year 1974—$618 million in the electric program and $140 million in the telephone program.

During 1973, REA made 593 electric loans totaling $588 million; 130 telephone loans totaling $159 million; and 113 Rural Telephone Bank (RTB) loans totaling $148 million. By the end of 1973, REA electric and telephone borrowers were serving about 26 million farms and other rural people in 47 States.

REA and the RTB provided $895 million in financing for its borrowers. Add to this the supplemental financing supplied by the National Rural Utilities Cooperative Finance Corporation (CFC) and other lenders, and more than $1.1 billion was loaned for the second straight year.

**Community Development**

An REA community development survey of 810 electric and telephone borrowers showed they assisted in 748 new or expanded community development projects in fiscal year 1973. These projects were in agriculture, forestry, recreation, community facilities, or manufacturing and service, and resulted in 40,732 new jobs for local people.

REA-financed electric systems sold 97.4 billion kilowatt hours of electric power in 1973, compared with 35.3 billion kwh in 1963. Some 135 systems made 800 or more new service connections in each of the past 3 years. One Midwest cooperative reported serving 53 trailer courts and 84 subdivisions. Rural growth and development helped stimulate this activity.

More and more people are building permanent homes or seasonal cottages and establishing businesses and commercial recreation enterprises in a healthful rural atmosphere. This kind of progress benefits the Nation, but it also multiplies the demand on REA borrowers for reliable and adequate rural utility service. Increasing amounts of money are required to provide for this escalating service demand.

**New Legislation**

It is in meeting the demand for increased rural utility service and in finding solutions to the energy shortage that Public Law 93-32 contributes so much. This new law completely recasts the fundamental loan processes of the Rural Electrification Act of 1936. It provides REA with its own revolving fund from which to make loans, and it affords new funding methods—direct, insured, guaranteed, and supplemental.

And, the new law all but removes the impact of the REA loan program on the Federal budget. It brings interest rates for most borrowers more in line with today's cost of money, and yet it sustains the historic 2-percent interest rate for those borrowers whose continued service capability relies upon low interest because of low density, low revenue, and other special conditions. Most borrowers are getting insured loans at the standard 5-percent interest rate. REA is preparing to guarantee loans for bulk power supply borrowers at interest rates linked to the cost of money.

Advances on REA loans are made from the Rural Electrification and Telephone Revolving Fund established in the U.S. Treasury. This fund will be replenished through collections on outstanding and future REA loans and from sale of borrower notes to the Secretary of the Treasury or the private money market. Limitations on amounts authorized for loans may be imposed annually by the Congress.

In its statement of policy accompanying the May 11 amendment to the Rural Electrification Act, Congress directed REA to continue to place high priority on one of the agency's basic policies. The new law endorses a practice long followed by REA—helping borrowers achieve success for themselves–by stating that: "Rural electric and telephone systems should be encouraged and assisted to develop their resources and ability to achieve the financial strength needed to satisfy their credit needs from their own financial organizations and other sources at reasonable rates and terms consistent with the loan applicant's ability to pay, and achievement of the Act's objectives."

**Demand for Power**

At the beginning of 1973, REA-financed systems were generating power of about 6.1 million kilowatts. During the year, REA approved loans totaling $225 million for power supply borrowers.

These borrower credit needs continue to outstrip REA loan fund capabilities. REA estimates power supply borrowers will need an average of $1.6 billion annually over the next 5 years, and looks to accelerated generation and transmission activity under the guaranteed loan provisions of P.L. 93-32.

Problems of energy shortages, increased operating expenses, the waste in duplication of facilities, environmental restrictions, and the growing necessity for regional and even national power transmission grids demanded totally united and concerted action by the entire electric power industry. Giant strides in such cooperation were taken in 1973.

The Mid-Continent Area Power Pool electrically connects eight Midwestern States and Manitoba, Canada, using Government-owned, investor-owned, and cooperatively owned facilities. Associated Electric Cooperative in Missouri, working with 40 distribution cooperatives, commercial power companies, and outside credit sources, is building a 600-megawatt generating unit with related transmission facilities. This will increase the capacity of the complex at New Madrid to 1,200 megawatts—the largest generating station of its type operated by a rural electric cooperative.

## Agricultural Research Service

Several significant advances of special interest to consumers and agriculture occurred in 1973 through the efforts of Agricultural Research Service (ARS) scientists. Highlights of research that involved food and other areas of the environment follow.

Protein from cottonseed flour should soon reach American dinner tables, thanks to an ARS-developed milling process now ready for commercial use. When run through the liquid-cyclone-process, each 100 tons of cottonseed should yield about 25,000 pounds of high-quality edible flour that contains about 65 percent protein.

ARS chemists have also evaluated another rich source of protein and minerals—corn germ flour—in cookies, muffins, and beef patties. These foods are not only enriched by the flour, but are fully acceptable in flavor, odor, and color.

The "chips-and-soda" set should benefit by the addition of protein sources to two snack foods—candy and soft drinks. Such protein sources as nonfat dry milk and soy have been tested successfully in candymaking; whey, a byproduct of cheese manufacture, has been used with success in carbonated and non-carbonated beverages.

### Nutrition Advances

ARS research shows that the percentage of unsaturated fats in beef may be increased by feeding "protected" polyunsaturated oils to cattle. The protection involves treating the polyunsaturated vegetable oil, a mixture of safflower oil and casein, with formaldehyde. This prevents the oil from becoming saturated as it passes through a cow's digestive system.

Two ARS scientists have invented a device that measures accurately and instantly the fat content of ground beef. It is designed to assure a specific fat content to consumers of ground beef. The inexpensive portable instrument can be used in supermarkets and butcher shops on meat with or without the plastic wrapper. Possibilities are good that the tester can be adapted to measure the amount of fat in other ground meats, including pork, lamb, and chicken.

Punched cards and magnetic tapes containing food composition data are now available for use by consumers who need information on the nutrient content of raw, processed, and prepared foods. These materials were developed by ARS in connection with the recently established nutrition data bank. The nutrition information will form the beginning of a universal coding system that may be used in food composition research, in dietary surveys, and in nutrition labeling. It is expected that the data bank will be highly useful to dietitians, physicians, social workers, and others.

What is believed to be the first research data to show that blood pressure can be lowered by reducing the level of fat in an otherwise normal diet has been reported by ARS. The data also indicate that the low-fat diet had a pronounced effect on factors important in blood coagulability (the tendency of blood to form clots).

*New and Improved Foods*. ARS research on a variety of blends of corn and soybean products indicates they have strong potential for direct use as snack and breakfast foods, as well as ingredients in gravies, cookies, breads, soups, and other foods.

A new frozen rice product, Rice Shapes, has been developed by ARS scientists. Rice Shapes are covered with a layer of ground potato or pinto bean flakes and then partially fried to form a thin, crisp crust that leaves the interior tender and chewy. They can be eaten as a snack or served as the carbohydrate portion of a balanced meal.

Delayed bitterness in citrus juice—a phenomenon caused by the formation of a bittering agent called limonin—may be reduced by an ARS-developed metabolic debittering process. This process, which involves an ethylene gas treatment before the fruit is juiced, is well on its way toward commercialization.

*Food Safety.* Development of a technique for identifying corn that may contain aflatoxin followed discovery by ARS scientists that under ultraviolet light broken kernels glow like fireflies if they contain materials associated with aflatoxin. This technique is now being used by corn buyers to determine whether corn should be analyzed chemically for aflatoxin level before purchase or processing. Previously, aflatoxin could be detected only by chemical analyses that take 15 to 30 minutes for each sample.

### ARS and Sludge

Agricultural scientists are looking at new ways for coping with municipal sewage sludge. One practical method may be to distribute this sludge on cropland to increase soil nutrients. A team of scientists at a 75-acre test site in Beltsville, Md., is investigating this method with the use of industrial and domestic sludge. Another ARS group at St. Paul, Minn., is working to develop an environmentally safe system for using sludge on agricultural land in a more severe northern climate. These experiments will enable the scientists to determine the greatest amount of composted sludge that can be applied to land for maximum benefit and minimum hazard. This research has led to large-scale testing of sewage sludge by environmental agencies in the Washington, D.C. area.

### Livestock Wastes

Livestock and poultry wastes, estimated at more than 1.5 billion tons a year, are potential sources of pollution. Among the approaches that ARS is taking to minimize this pollution risk are: (1) finding ways to control the runoff associated with feeding cattle in confinement, and (2) using the pollutants in making useful products.

Scientists concerned with the first approach have found that widespread contamination of ground water by infiltration from the feedlot surface is improbable, but that surface runoff may transport heavy loads of pollutants. They recommend that feedlots be designed to restrict this surface runoff. Another study indicates that oxidation ditches can be used to collect the animal wastes, aerate them, and mix them to promote bacterial breakdown and restrict odors.

Research designed to develop useful products from animal wastes is concentrating upon protein-rich feed for livestock, cellulose for fiber and pulp products, and enzymes to digest fiber.

### Water Pollution

A promising method for recovering mercury and other heavy metals from water they pollute was discovered by ARS scientists. While searching for new durable-press finishes for cotton, they found that the compounds they were testing have a high affinity for metal salts and can make cotton a highly efficient "trap" for waterborne heavy metals. The trap can be regenerated for repeated use. It is capable of reducing the mercury content of contaminated water below the five parts per billion now permitted in drinking water.

In a related study, ARS researchers found that starch xanthate from corn, united with certain polymers, can precipitate valuable metals so they can be recovered from water. The method recovers silver, chromium, cadmium, copper, lead, nickel, zinc, iron, manganese, and mercury—all valuable to industry. The process also provides a way to keep these metals from reaching toxic levels and polluting.

Strip Mining

With the energy crisis expected to create an upsurge in demand for low sulfur coal, new attention is being focused upon the revegetation of strip-mined lands. Typical stripping procedures leave material from the bottom of the stripped trench on the surface. Because these materials usually contain large amounts of clay and sodium, revegetation is difficult.

ARS scientists working in the northern Great Plains have developed several treatments for revegetation, although to date plant growth in response to the best treatment has been only 25 to 35 percent of what might be expected for unmined soil. These efforts are continuing in response to the growing urgency of the problem.

Animal Science

ARS is mounting an intensive effort to help farmers produce more meat—especially beef. One study indicates that, generally, young bulls will produce 25 to 40 percent more lean meat than steers on the same diet. A related study showed that Holstein-Friesian dairy steers may become an even more important source of beef. Tests showed that these steers produced acceptable carcasses and gained as well, if not better, in the feedlot than Hereford steers.

Poultry industry acceptance of the ARS-developed vaccine against Marek's disease of chickens has been immediate and enthusiastic. The vaccine was in use within 2 months after USDA authorized commercial production. A nonagricultural benefit resulting from this development lies in its potential applicability to research on human cancer vaccines.

Insect Control

Insects that represent threats to agricultural production are getting priority attention from ARS scientists. A promising approach being closely studied is integrated pest management. This maximizes the use of natural beneficial insects, but also relies on other techniques—chemical, cultural, biological, and genetic. Crops now included under integrated programs are cotton, apples, alfalfa, sweet corn, and tobacco.

Surveys for gypsy moth infestations show extensive spread of the moth from the Northeast during 1973. A practical means to stop this spread is the use of disparlure, the synthetic form of the gypsy moth sex attractant. Tests during 1972 and 1973 in Massachusetts and Pennsylvania continued to reinforce the promise of earlier trials indicating that disparlure can markedly reduce the number of males finding females for mating. The attractant shows a potential for eliminating light infestations of the moth, especially in outlying areas.

Initial field tests of muscalure, a newly identified sex attractant for houseflies, show that the attractant more than triples the flies' response to traps and baits currently in use. Muscalure's potential value in reducing the need for insecticides is greatly enhanced by its ability to attract both males and females.

In a related study, ARS scientists found that resmethrin, a synthetic insecticide related to pyrethrum, is exceptionally effective against both flies and cockroaches when it is applied as a superfine dust. Applied in a confined area, it knocks down stable flies within

10 minutes and houseflies within 30 minutes. Within a few hours of knock down, the flies are dead. Roaches exposed to resmethrin die within 24 hours. Resmethrin is virtually harmless to warmblooded animals.

Insects damage and contaminate millions of bushels of stored grain at an annual cost to the U.S. economy of $1.2 billion. ARS scientists have successfully tested a practical method for saving some of this grain by using a sublethal dose of radiation to sterilize insects in stored grain. This interrupts their reproductive cycle and thus reduces infestation. Although the sterilized insects may continue to feed upon the grain until they die, they do not pose a serious threat of further significant grain damage.

Plant Diseases

Bacteria that inhibit activity of other bacteria may provide biological control of one of the most costly and widespread soybean diseases, bacterial blight. Studies by ARS and State plant pathologists indicate that the bacterium *Bdellovibrio bacteriovorus*, or others similar to it, may influence whether some pathogenic bacteria become pathogens or remain as harmless residents on plants.

A way to predict epidemics of wheat stem rust is now under development. Plant pathologists in ARS and APHIS have employed a computerized technique to formulate equations for predicting the severity of stem rust 7, 14, 21, and 30 days after date of prediction. This should benefit growers who must decide when to use fungicides. Since growers operate on a small margin of profit and cannot afford to use fungicides except in epidemic years, they must apply these chemicals early to restrict buildup of the disease.

Plant pathologists who tested the effectiveness of foam and spray applications of fungicide to control diseases of sugar beets and celery have concluded that foam applications control the diseases as effectively as spraying, and with less hazard to the environment. The scientists found that using foam allows more uniform suspension of the material, reduces lateral spray drift from aerial application, and permits greater deposits of fungicide on plant leaves. Foam can also be used on days when wind prevents spraying by conventional methods.

## Cooperative State Research Service

Under the Hatch Act of 1955 and the McIntire-Stennis Cooperative Forestry Research Act of 1962, the Cooperative State Research Service (CSRS) administers Federal grant payments for research at the agricultural experiment stations and eligible schools of forestry. CSRS also assists State experiment stations and other U.S. Department of Agriculture agencies in planning and coordinating scientific research programs.

Sunflower Particleboard

University of Minnesota forest products scientists have been evaluating the use of sunflower hulls for particleboard. By 1980 about 1 million acres of sunflowers may be grown in the United States generating about 100,000 tons of waste hulls. The research indicates the particleboard can meet commercial standard requirements for medium density interior boards.

Adhesion of the sunflower hull surfaces is probably the most limiting factor. But if internal bond can be upgraded, the hulls may be suitable as a core for three-layer boards. Aspen flakes provide added strength. The economic feasibility of operating sunflower processing and particleboard manufacture together is worthy of consideration.

**Potential Peanut Profits**

The North Carolina and Florida Experiment Stations have released a new, early maturing, large-seeded Virginia bunch-type peanut which, over a 3-year period, grossed 12.8 percent more value per acre than the average of the three standard varieties. This variety has a potential of returning to the grower approximately $50 per acre more than the commonly grown varieties. If grown on 20 percent of the 273,000 acres of peanuts planted in the two States, growers could receive an additional $2,770,000 each year.

**Protein-Enriched Bread**

A public patent on a process for making highly nutritious protein-enriched bread has been awarded to cooperating USDA-ARS scientists at the Wisconsin and Kansas stations. Two cereal chemists developed a way to increase the protein content of bread about 70 percent, as well as tripling the concentration of lysine.

Inventions by USDA scientists are normally made available on a nonroyalty basis to responsible applicants, with license granted on terms and conditions considered the most favorable to the public interest.

**Music Makes Contented Pigs and Cows**

According to a recent survey of 43 swine-producing farms, music in the farrowing and finishing houses affects production. The pigs are more contented, less nervous, and not as apt to jump up and run around when a sudden noise occurs or someone enters the building. More pigs are weaned per litter and there is less tail biting. Cows are known to be less nervous and give more milk in music-filled dairy barns. Now it appears that pigs also respond favorably and have preferences; music of the 1930's and 1940's produces the best results.

**High-Lysine Sorghum**

A front-page story featured the development of what was termed a "gift-of-life" grain. Members of a Purdue project funded by the Agency for International Development have discovered how to upgrade the protein content of sorghum, the world's fourth most important cereal crop.

The basic food of 300 million protein-deficient people, sorghum, has not provided nutritive quality because it lacks lysine. Scientists collected sorghums, screened 10,000 varieities, and fed likely ones to rats. In this screening, a graduate student found the two Ethiopian strains rich in lysine. It is believed that the new sorghums can be developed by the 1980's.

**Victory Over Pear Decline**

Pear trees in California now have more than a fighting chance for survival into many growing seasons. A plant pathologist at the University of California at Davis has developed, together with other scientists, a cure for pear decline, a disease which devastated the State's pear industry.

Since its initial outbreaks in 1959, pear decline has destroyed 1.2 million trees. Though the industry has made a spectacular comeback since those days, about 20 percent of the 2 million old bearing trees continue to suffer from lesser effects of the disease. Now these trees, too, will prosper fully after they receive transfusions of the cure—Terramycin.

Terramycin not only leaves no residue to affect the next season's fruit when it is properly applied as liquid chemical but it may also help to combat "western X" disease in peaches and "buckskin" disease in sweet cherries.

### Inducing Milk Production

Ohio dairy scientists have successfully field tested a technique that uses a combination of natural hormones to induce milk production in dairy heifers or cows that are not pregnant.

Normally, dairy cows do not begin to produce milk until they calve. However, an estimated 10 percent of all dairy cows do not conceive when they are mated because they have some reproductive malfunction. Such cows are eventually culled and slaughtered although they may be potentially high milk producers.

To salvage these cows, dairy scientists at the Ohio Agricultural Research and Development Center developed the hormone technique, the most reliable thus far. Field tests last year achieved 79 percent success. Cows averaged 30 pounds of milk a day, 10 pounds higher than the estimated minimum level required for a cow to be profitable in the herd. If this experimental technique is approved for general use through licensed veterinarians, its cost ($7 to $10 per cow) should be within the reach of every dairy operation.

Though bearing a calf is the best way for a cow to begin milk production, the hormone treatment may provide the means to save high milk-producing cows with reproductive problems.

### Mercury Damages Eggs

A New York station scientist reported recently that organic mercury (methyl mercury chloride) harms production and quality of poultry eggs more than do DDT or PCB's (polychlorinated biphenyls). At concentrations up to 100 parts per million, combinations of DDT and DDE (a biological breakdown product of DDT) have no adverse effect on eggshell quality for laying hens and quail.

However, experimenters at Cornell found that organic mercury at the level of 10 parts per million greatly affected egg production, eggshell quality, egg weight, and other characteristics. At 20 parts per million, toxicity became quite severe, and it caused 30 to 40 percent of the eggs to be grossly misshapen or truncated. In the inorganic form, mercuric sulfate, mercury does not have lasting effects on poultry until the 200-parts-per-million level is reached.

Thus far, commercial feed ingredients including fish meal, which is a likely candidate for mercury contamination, apparently do not contain harmful levels of methyl mercury.

### Possible Enzyme for Cancer Remission

Phenylalanine ammonia-lyase, a plant enzyme produced and purified from potatoes by two Connecticut station scientists, is being used experimentally as a possible method of stopping advance of leukemia.

### Solid Waste Disposal

Florida scientists have shown that as much as 200 tons of ground-up garbage can be disposed of on an acre of forest land without harmful effect and with substantial growth improvement of the trees. Such disposal does not adversely affect groundwater supplies.

### Nutrition of Rural Children

Food scientists at North Carolina A & T State University discovered that 14 percent of the children they studied were undernourished and 19 percent were obese. Although 83 percent of the diets met requirements for meat, citrus fruit was inadequate in 74 percent and milk in 97 percent of the diets. The data are providing information for programs designed to upgrade nutrition of rural youth.

**Extension Service**

As American farmers shift a policy of surpluses to a market-oriented agriculture, Extension Service (ES) has been reassessing and reassigning priorities. Specific examples of its work follow.

Pest Management

The pest management program, initially aimed just at insects, has been expanded to include plant diseases, nematodes, and weeds. In 1973 this program involved 39 projects in 29 States dealing with 19 major crops. The objective of pest and disease management is to establish alternative choice systems of control that are effective, economical, and environmentally sound. State Extension Service entomologists have led in training scouts to walk fields and make inspections for insects. They have also produced and delivered educational materials. Depending on the type of local agriculture, crops involved, and pest complexes, the involvement of the USDA Pest Management Program varies from 10-acre blocks within orchards in Pennsylvania to 224,900 acres of cotton in Arkansas.

Energy Management

In May 1973, the Extension Service specialists started preparing and distributing fact sheets on how to save energy on the farm. Subjects included fuel, fertilizer, electric energy, home heating, and overall energy management on the farm and in the rural home. These fact sheets were distributed to State Extension specialists who in turn made distribution to local ASCS offices, to the editors of farm magazines, and to local media. State Extension services supplied other material on energy. In November, Extension surveyed State Extension services to find out (1) the energy program of each State, (2) areas where Extension needed more emphasis, and (3) energy research needed.

Production and Marketing Programs

In 1973, Extension Service programs were designed to improve performance of commodity production and marketing systems. Special emphasis was focused on wheat, cotton, soybeans, swine, beef, sheep, potatoes, and apples. A National Wheat Industry Resource Committee was formed in cooperation with the National Association of Wheat Growers (NAWG), the State Extension services, and the State wheat associations. Eight problem areas are being researched and educational materials are being prepared for distribution. The Extension Service and NAWG held four regional wheat meetings in August 1973 at Oklahoma City, Okla., McCook, Nebr., Rapid City, S. Dak., and Pendleton, Oreg., to get the latest outlook information to wheat producers. A pilot project in Montana to improve wheat marketing information for wheat growers included a call-in service with up-to-date information on the wheat market and situation each day. The National Soybean Industry Resource Committee (established 1971), composed of Extension and research personnel, meets each 6 months to identify problems and needed materials. A soybean producer committee has now been established to work with the resource committee.

Extension has produced and distributed 40,000 copies each of "Building World Markets for U.S. Soybeans" and "Soybean Demands Around the World." Educational materials have also been prepared and distributed on "Double Cropping with Soybeans" and "No-Tillage Soybean Production."

Extension helped organize a soybean disease workers council in 1973 to provide guidance for soybean disease work. Four regional soybean-feed grain conferences were organized late in 1973 to be held in February 1974 to provide soybean and feed grain producers the latest information available to help them make planting decisions. They were to be held at Atlanta, Ga., Memphis, Tenn., Indianpolis, Ind., and Ames, Iowa.

Leadership in the field for the pest management program in cotton has been provided by the Extension Service in cooperation with State and Federal agencies. Extension also has worked with the USDA program in cotton to increase production of quality cotton in the 14 major cotton States. It also has used extensive educational programs to improve cotton ginning and harvesting techniques and practices, field testing of narrow-row planting, and improving seed cotton storage methods. This includes the development of modules to store cotton in the field to be transported later to the gin.

"Earning A Living With Sheep" was published in February 1973 and 5,000 copies were distributed. Four regional sheep-for-profit task forces composed of State Extension specialists and others working with the industry were organized in 1973. Two of these task forces, the western and southwestern, held a symposium on profitable range sheep production in Denver in October. Work was also completed on the last two management systems for 1,000- and 6,000-ewe range flocks. Several thousand copies of the system outlines have been used by the sheep industry development program and Extension personnel. Demonstrations were begun in 10 States. A market information system for sheep, lamb, and wool was put into operation with the help of the Extension Service. It is operated by the American Sheep Producers Council, and allows producers and marketers to call free of charge to obtain the latest price information.

Because one of the major aims of Extension is to improve the efficiency of the cow-calf segment of the beef industry, the Extension Service, the Great Plains Council, and the American National Cattlemen's Association are sponsoring a beef cattle symposium in 1974. It will focus on research and Extension programs to increase the efficiency of obtaining weaning weights of calves in the Great Plains in the 1970's and 1980's. The Southern Beef Conference also will be held in 1974.

Meanwhile, the Extension Service continued its help to the swine industry through research reviews and development of fact sheets. Fact sheets and visuals were prepared to help producers prevent the pork stress syndrome.

## Farm Safety Program

Twelve State Extension services have cooperated with farm organizations and the National Safety Council in conducting farm accident surveys. The first steps in safety leader training have been taken through coordinated farm safety seminars.

Project Safeguard, a pesticide safety educational program, is directed toward small acreage cotton, peanut, and soybean farmers expected to use the more highly toxic insecticides as substitutes for DDT in their pest control. The major objective of the 15-State program is to alert small farmers to the hazards involved in the use, handling, transportation, storage, and disposal of pesticides. In most States, small farmers were contacted by safety aides. As of August 1973, over 126,000 farmers (90 percent of the target audience) had been contacted.

**Food Safety**

A joint industry-USDA task force was organized during the year. Designated Project Consumer Concern, it produced:

(1) Development of three demonstration stores in Pennsylvania, North Carolina, and Ohio for defining food safety problems and testing consumer education methods.

(2) Development of total food store sanitation procedures for use by supermarkets, and checklists for use of supervisors in these firms.

(3) Presentation of food safety information to national, regional, and State grocery associations, and to the Food Distribution Research Society.

(4) Distribution of the total food store sanitation procedures to the food industry by the National Association of Retail Grocers and to Extension specialists responsible for food safety.

(5) Development of plans with Ohio State specialists for conducting a coordinated food safety program for food retailers, with participation by area Extension agents; food science, food distribution, and home economic specialists; local health inspectors; State agricultural inspectors; and State grocer associations. In cooperation with Agricultural Research Service, Oregon State Extension Service conducted a study to determine the cost of implementing a total store sanitation program. A slide set was developed.

**Environmental Improvement**

Extension Service is funding a pilot project on animal feedlot waste in the southern Great Plains and Iowa. The 6-State Great Plains project has brought the installation of waste management systems which meet Environmental Protection Agency (EPA) guidelines, limitations, and standards. Educational materials developed under the project have been used by 29 colleges and universities and summer institutes and in short courses. Fact sheets were developed and distributed in 10 Great Plains States to feedlot operators and educators. Extension Service helped EPA develop standards and regulations for concentrated animal production systems for the national pollution discharge elimination system. State Cooperative Extension Service personnel helped develop a national workshop to assemble knowledge of recycling municipal effluent on land. The published proceedings will be distributed to all States. In conjunction with the National Science Foundation, the Extension Service initiated pilot projects to test systems and methodologies that will be affected in the direct transfer of environmental information to State and local governments. Projects are in Colorado, Oklahoma, and Tennessee. The Extension Service also worked on an EPA task force to reassess the National Pollution Discharge Elimination System (NPDES) proposed guidelines. The guidelines and regulations established criteria for feedlot operators that must register and apply for a permit to discharge effluent into U.S. waters.

Progress continued in the pilot project "Decision Making on Environmental Problems in a Rural Urban Setting," which the Extension Service is developing in cooperation with the University of Wisconsin and Milwaukee County Extension Services. Educational programs for State and local decisionmakers were cooperatively developed and conducted on land use, solid waste, natural erosion, the energy crisis, recycling, and air and water pollution. In cooperation with the Colorado State Extension Service, the Extension Service developed a memorandum of agreement with region VIII of EPA for an analysis of nonpoint source agricultural pollution in the Rocky Mountain prairie region. This pilot project is related to the Federal Water Pollution Control Act Amendments of 1972. In cooperation with EPA, other agencies in USDA, and State Extension services, ES is conducting studies to assist in the practical implementation of the Federal Water Pollution Control Act Amendments of 1972 (P.L. 92-500). Special emphasis has been placed on a "national pollutants discharge elimination system," and related regulations and permits required by P.L. 92-500 for agriculture and associate industries.

The Extension Service helped in a national symposium on the "Textile Industry and the Environment" held in Washington, D.C., May 1973. All phases of air, water, and in-plant environmental problems, including cotton dust or "byssinosis," were discussed and evaluated. The sponsor of the symposium was the American Association of Textile Chemists and Colorists.

**Forestry**

State Extension programs at the county, State and national levels have focused on forestry demonstrations, publications, visual aids, and in-depth workshops for both resident and absentee landowners. Implementing the latest research in forest management harvesting and marketing is a major educational thrust. Absentee forest land meetings have now been conducted in the South, New England, Great Lake States, and the Midwest. In 1974, these meetings will be conducted in the Great Plains Region, Rocky Mountains, and the West. In some regions, absentee owners control as much as 90 percent of the forest resources, while nationally farmers own approximately 40 percent. A large percentage of these woodlands have not been available for timber harvesting. Absentee owners are now being exposed to the concepts of multiple use in forest land.

Extension forestry has established 2-year programs for training sub-professionals for forestry and wildlife field jobs. Because of a shortage of skilled workers, this program is receiving broad support from the forest industries.

Over one-fourth of Texas' 150,000 tree farmers live in metropolitan areas, sometimes far removed from their land. Since the start of the Texas Extension program, educational efforts with the growing number of urban timber landowners and the 5,000 timber growers who own more than 2 million forest acres have resulted in in-depth teaching sessions on forest management, small woodland holdings, industrial forestlands, reforestation, and income taxes.

**Financial Management**

Close relationships were maintained with the North Central Farm Management Committee in the preparation and dissemination of four regional publications on financial mangement. These publications have received national distribution. Minnesota developed computer programs to correspond to the financial management tools and analysis contained in each of the publications. These programs are adapted for use by remote terminals. Seventy-two computer programs concerned with financial management were included in another publication.

Many States conducted specific programs in financial management during fiscal 1973. In Georgia, a series of three-session workshops was conducted in 60 counties last year. Georgia reports that the workshops were quite successful when lending organizations served as co-sponsors. State Extension specialists also participated in a financial management program involving a week-long, tri-State managers' workshop in Mississippi. Fifty managers in farm supply co-ops from Alabama, Louisiana, and Mississippi attended.

Several States are analyzing the capital structure of co-ops. As a result, a number of managers of farmer cooperatives are seeking ways to develop a strong cooperative structure that does not tie up excessive amounts of capital needed by farmers in their farming operations.

### Educational Programs

An educational effort initiated by the Extension public policy educational committee of the north-central region entitled "Who Will Control U. S. Agriculture?" has resulted in a publication and a series of discussion leaflets for use in educational programs. Used in multi-State meetings of farm and agribusiness leaders, the publication points out ways in which leaders and individual farmers can effect the changes which may occur in the structure of agriculture. Following these meetings, many States are initiating intensive educational efforts with farmers. Alternatives to control of agriculture are discussed. To date, 46,000 copies of the five-part discussion leaflets have been ordered by individual States. In addition, more than 1,500,000 copies of the discussion leaflets have been printed and distributed in farm magazines. These educational programs enable the independent family-owned farm operator to better understand the effect that economic pressures and Government action have on the structure of the agriculture within which he must operate.

### Farmer Cooperatives

An intensive effort with Southern States Cooperative has resulted in three regional meetings at which cooperative leaders and boards of directors discuss ways to improve their operating capabilities and competence, and thus better serve their farm clientele. The results of this effort should strengthen the leadership and overall operation of Southern States Cooperative. In conjunction with the Farmer Cooperative Service, the Extension Service is making an additional effort to provide intensive training for boards of directors, an opportunity for both present and potential members. The strengthening of cooperatives to better serve farmers will in turn strengthen the family farm.

### Help Through Home Economics Education

More than 10 million individuals, families, and groups are improving the quality of their home and family life each year through Extension's out-of-school home economics educational programs. More than 4,000 local professional home economists and nearly 8,000 paid aides are teaching people the knowledge and skills needed to adapt in today's complex world. Volunteers from the community—members of the audience to be reached—participate. Thousands of volunteers are trained to teach others. Nearly 1,000 home economics specialists at State land-grant universities provide back-up information and training.

### Food and Nutrition Education

Getting the most food for the dollar, understanding rising prices, producing and preserving food at home, following good food safety practices, and planning nutritious meals are important for consumers. One-third of all Extension home economists' time is devoted to this. Priority attention is given to young consumers and low-income families. States are encouraged to help families—

- Improve their diets.

- Apply and relate food buying, food preparation, and safe food handling practices to family skills, needs, and resources.
- Increase food supplies through improved home production and preservation of food.

In the 5 years since it began, Extension's Expanded Food and Nutrition Education Program has taught 917,000 low-income families to improve their diets through the one-to-one and small group teaching of paid program aides. Most of the aides come from the communities in which they work and understand local problems. The nearly 8,000 aides are currently employed in 1,500 locations in the country. Since 1968, more than 21,000 aides have been employed. Their training and experience have often led to further schooling, higher paying jobs, and better lives for them and their families.

Extension is cooperating with other USDA agencies and the Food and Drug Administration in an educational program to reach consumers with the "whys" of good food safety practices. New leaflets deal with keeping food safe and feeding a crowd. States are reproducing those publications which are available also through the Government Printing Office. Food safety visual presentations have been prepared for use with both small and large groups, and for television use. Suggested radio scripts, TV ideas, and news releases were also sent to States. States are currently using over 1,500 copies of phonoviewer programs on food safety, many reporting they are reaching low-income homemakers. Many States are doing press releases, developing their own publications, teaching tools, and so forth.

## Consumer Education

Today's consumers find it difficult to understand the rapid and continuing changes—economic, political, social, and technological—that affect them. Yet, 80 percent of personal income after taxes is spent on consumer goods and services. Extension's programs in family economics, management, and consumer education are designed to help consumers–

- Understand and use economic and management principles when selecting, buying, using, maintaining, and disposing of goods and services.
- More effectively use human, natural, and other resources to reach their goals.
- Understand how economic, political, and social systems affect them and how they affect these systems.
- Understand consumer and business rights and responsibilities and how to act responsibly.

This year, major priority at the national level has been given to—

- Assisting States with consumer education programs. Focus has been on the rising food costs and the energy crisis.
- Assisting specially funded projects in seven States which are emphasizing credit, food buying, and money management.
- Helping to strengthen 4-H programs in personal and home management and consumer education.
- Evaluating State program development following the 1972 national workshop for family resource management specialists.

An Extension home economics consumer education committee has sent States packets of information, guidelines, teaching methods, materials, and so on. It has also prepared a slide set on shopping.

In a typical State effort to teach consumers, Iowa, during a 1-year period, taught 55,000 families and 63,000 youth about consumer rights and responsibilities through newsletters and meetings. Mass media reached an estimated 500,000 families. Tennessee taught consumer education to nearly 7,000 youth through self-learning centers set up in summer camps. Colorado's Extension educators are now coordinating their efforts (on a statewide basis) with the State's attorney general's office of consumer affairs. Through local Extension offices, consumers can receive information and referrals to other sources of help. For 2 years Wyoming has held "consumer days" throughout the State. Nearly 4,000 consumers have received information. Florida reached 9,000 young people with a "Know Youth World" series on credit, food buying, money management, and banking. In a pilot project, Texas developed a series of 10 money management newsletters for young families. More than 1,300 families requested copies.

### Health Education

In educational programs relating to health, Extension helps create awareness of health services. In a typical health education effort, Arkansas Extension volunteers and others (10,000 in all) supported a statewide immunization drive to protect 225,000 children against polio, rubella, measles, diptheria, tetanus, and whooping cough.

Extension provides educational assistance to handicapped homemakers. It is represented on health committees such as the President's Committee on Employment of the Handicapped, Rural Areas Subcommittee, and National High Blood Pressure Educational Program Interagency Working Group. Liaison and cooperative efforts are developed with other agencies and organizations as well.

### Other Activities

In a Texas housing program, thirteen 30-minute TV programs on home maintenance were produced and shown in 30 counties. Nearly 1,000 low-to moderate-income residents came to meetings in one county. More than 30 publications were produced.

With an increasing scarcity of textile materials, rapidly increasing costs and rapid changes in technology, Extension is helping States develop programs and materials to meet needs in this area, working with industry in developing teaching materials, preparing publications, and doing mass media work.

States everywhere are making efforts to provide young families with information. Two national workshops were held in 1973.

### Youth Development

In 1973, expansion of 4-H programs to reach more youth wherever they live and whatever their socioeconomic background was a prime target. Currently 27 percent of the youth reached through 4-H youth programs are from minority ethnic and racial groups. Though Extension has continued strong 4-H programs for farm and rural youth, shifts in recent years include the following:

- More emphasis on science.
- Response to important national concerns, such as greater agricultural production, environmental improvement, drug education, and other health subjects.

- Inclusion of career exploration and youth employment as integral parts of 4-H projects.
- Concentrated nutrition education for low-income youth.

Extension is now serving over 5 million youth. Over 520,000 volunteer leaders—adults and junior and teen leaders—assisted last year.

*4-H Members in 4-H Clubs and 4-H Special Interest Groups By Place of Residence, 1973*

| | Percent |
|---|---|
| Farm | 27.8 |
| Towns under 10,000 and open country | 41.4 |
| Towns and cities 10,000 to 50,000 | 16.1 |
| Suburbs of cities over 50,000 | 6.4 |
| Central cities of over 50,000 | 8.3 |
| | 100.0 |

Enrollment in 4-H projects and activities during the past year increased over the previous year's enrollment. In 1972, there was a project enrollment of 7,482,510, with an average of 2.75 projects per member. The most popular 4-H projects follow.

| *Project* | *Enrollment* |
|---|---|
| Animal science, production | 1,314,386 |
| Clothing | 736,666 |
| Food and nutrition (not including EFNEP) | 795,734 |
| Recreation, arts, craft | 611,917 |
| Plant science, crops | 547,535 |
| Community service, citizenship | 436,725 |
| Conservation–soil, water, wildlife, forestry | 479,123 |
| Safety, emergency preparedness | 340,860 |
| Health, physical fitness | 305,700 |
| Personal development | 252,739 |
| Bicycle care and safety | 302,436 |
| Tractor, small engines, automotive | 236,344 |
| Home improvement and furnishings | 173,836 |
| Public speaking | 182,763 |
| Woodworking and other shop | 143,866 |
| Family life, child care | 162,344 |
| Electric | 130,848 |
| Home management, money management | 112,483 |
| Photography | 117,120 |
| Career exploration | 85,713 |

*4-H Rural Community Development.* Rural community development was a major thrust of 4-H youth programs in all States and Puerto Rico during the past year. Almost all 4-H'ers participated in programs designed to improve their own communities such as soil, water, and wildlife conservation; pollution control; and community beautification and cleanup. They served on local or State community development committees, conducted studies and surveys, developed community centers, and organized other special projects.

In Virginia, a "youth in action" program was initiated to help youth learn about their communities, develop skills in community leadership, and carry out significant action projects to improve the quality of their environment. Programs being undertaken by these groups included a study of solid waste disposal systems. Also studied were recreation opportunities. Facts on recreation will be presented in a brochure for such purposes as planning and facility surveys. Youth in these groups worked on citizens' committees on solid waste disposal, recreation committees, county improvement councils, and on similar planning committees.

*Food and Nutrition Program.* The fastest growing phase of the 4-H program is the expanded nutrition education program. The aim of the program is to improve dietary levels of low-income families, particularly city youth. Since its inception in July 1970, over 1,165,970 youth have been reached.

For the first 6 months of fiscal 1973, some 498,583 boys and girls, under the leadership of 84,811 volunteers, were enrolled in the program. Along with better eating habits, youth learned easy food preparation and food shopping skills. They participated in camps, tours, educational games, and other activities.

*4-H Project and Curriculum Development.* During the year, 13 national 4-H program development committees reviewed present projects and programs, updating them or initiating new programs with additional curriculum materials. Areas covered by these committees were aerospace; consumer education; furnishing, housing, and equipment; horses; 4-H incentives and awards; staff development and training; urban projects; home management; petroleum power, electricity, nutrition, citizenship, and community development.

The petroleum power and electric committees are pulling together materials on the energy situation and preparing educational materials. Plans have been completed for appointment of an avian program development committee which will include poultry projects, and an animal science committee to deal with beef, sheep, swine, and meat projects.

*Health Programs.* Every State conducts an educational or preventive drug program for youth. Extensive use has been made of the Social Seminar Training Laboratory (President's NIMH Program). The 4-H Youth Development Program of Extension Service received a $100,000 grant from HEW (NIH) for use with 4-H teens in education for parenthood. Educational programs for child development and parental responsibility are being implemented in four geographic locations.

*Teen and Older Youth.* A national workshop on programming for teens was attended by 32 State and county professional staff members. Twenty-six of these youth workers have conducted similar workshops in their own localities.

Most States showed an increase in number of people-related interests. Typical of these are programs dealing with geriatric care, child advocacy, comparative religion, teens tutoring tots, consumer concerns, and voter responsibility. A special grant for a 4-H career pilot program in New Mexico has produced a highly workable model for training and placing teens in jobs in the community.

*Disadvantaged and Minority Youth.* Approximately 28 percent of the youth reached in 4-H programs are from families with annual incomes of $3,000 or less. Twenty-seven percent are from minority racial or ethnic groups.

More than 15 States held opportunity camps for disadvantaged youth last year. Vermont built the 4-H method into three urban centers for 4,000 low-income youth. Georgia trained 4-H teen leaders to work with 6,000 low-income youth on nutrition, health, and personal development.

As a part of special efforts in Texas, 4,835 additional Mexican-American youth have been enrolled in 4-H activities and 460 volunteer leaders from this minority group have joined the work. Projects in which the youth participated included vegetable gardening, fire prevention and safety, motorcycle safety and maintenance, and 4-H nutrition.

A 4-H garden production program on the Wind River Indian Reservation in Wyoming has encouraged more family gardens on the reservation and has helped 4-H members learn the importance of supplementing the family food supply with local home-grown vegetables. It has also stimulated more gardens among other adult Indian families.

*Citizenship Courses.* Over 6,000 4-H-ers, leaders, and county and State 4-H agents participated in 4-H short citizenship courses at the National 4-H Center last year. Young people participated in workshops on such topics as economic choice and the citizen, communications, values and human relations, conservation and environment, community development, man's freedom and dignity, world problems, and youth involvement in the Nation's government. Several States are reporting plans to celebrate the Nation's bicentennial.

*Volunteer Leadership.* Last year 307,689 adult leaders, 146,599 teen leaders, and 51,350 other leaders were involved in 4-H programs at the local level. This is an average of one leader per 8.5 members enrolled in organized 4-H Clubs, special interest groups, EFNEP, and TV 4-H groups.

*Use of Paraprofessionals.* Reports from States indicate that over 1,000 paraprofessionals are now serving the 4-H program, including a large percentage of college graduates working part time. They are doing many of the tasks previously performed by 4-H agents, thus permitting professional staff more time for planning, training, and program management.

*Instructional TV.* The impact of two recently developed 4-H TV series was especially evident last year. An estimated 3/4 million or more youth in 10 States have participated in the 4-H nutrition TV series, Mulligan Stew. Thirty-five States have purchased about four million member manuals to use with this series. Thirty-five States were expected to schedule Mulligan Stew during the fall and winter of 1973. The energy crisis has increased interest in the 4-H TV series, "Living in a Nuclear Age." Some 50,000 youth in four States were reached through this series.

## Community Development

Nearly all Extension employees spend part of their time on rural development; and more than 600 of them devote virtually full time to it. These programs reach into practically every county in the Nation. In fiscal 1973, Extension spent 1,324 man-years providing rural development information and technical assistance; assisted with 46,000 community projects; made 10,790 surveys and feasibility studies; convened and conducted 49, 019 workshops, conferences, and meetings and assisted with 45,636 more; distributed more than 5 million copies of about 175,000 different publications; and presented about 50,000 audiovisual programs.

## Equitable Health Care Systems

One of the major objectives of the Ottumwa, Iowa, Extension Service is to assist local people in developing a structure for a more equitable health care system. The area office, cooperating with county Extension staff members, assisted in organizing nine county health planning councils in the 10-county area. Each council named representatives to an area group called the Tenco Health Planning Agency, and a committee is moving toward certification, funding, staffing, and development of an overall health care plan.

### Medical Care in Remote Areas

Medical care has not been available since 1968 in any town in Wheeler County, Oreg. (pop. 1,849). The county court, in consultation with the State and area rural development committees, identified medical attention as number one among needs of the county. A year of work brought assignment of a doctor from the National Health Service Corps to Wheeler County. A church provided clinic space. In the first year, office calls will average nearly two per county resident.

### Industrial Development

Seventeen persons from four Western States completed the first Extension self-study course in rural industrial development in November. Participants came to the University of Arizona for a 3-day workshop that culminated a 10-week self-study period. Participants said they would conduct industrial development training for other State and Federal agency personnel, as well as community leaders in their own States. Those completing the course included Extension personnel, Farmers Home Administration employees, and a representative of a State office of rural development. A textbook and complete self-study course will be available for national use in 1974.

### Manpower Development

Extension maintains liaison with State employment services to identify job opportunities and training needs. In many States, Extension representatives serve on manpower planning councils established by the governors and on community and local councils or boards. In a number of States, "Operation Hitchhike" projects have been developed and are operated jointly by Extension and the State employment service.

In one county in Virginia where there is a Hitchhike project, 844 job placements were made in fiscal year 1973, providing more than $4 million in yearly salaries and $15 million to the county's economy.

In the six-county project area in Oregon, there were 749 job placements, 754 job orders, and 908 requests for counseling service. Over 1,100 referrals were made and 87 new jobs created.

### Community Housing

Assistance in establishing regional or multicounty housing authorities was more extensive than previously. Assistance also was given in establishing countywide authorities to serve those living outside incorporated towns and municipalities. In Pepin County, Wis., where only 26 percent of the county's households (representing over 35 percent of the total population) qualify for public housing, an extensive educational program resulted in the formation of a countywide authority.

### Comprehensive Land Use Planning

Extension provides substantial comprehensive planning assistance to State governments, multicounty organizations, and local development groups. For instance, in response to community demand in Pennsylvania, Extension developed two correspondence courses on comprehensive land use planning for individual and group instruction. Training programs have been conducted in almost all counties of the State and in many townships and boroughs. These meetings are usually cosponsored by a local government unit.

**Environmental Improvement**

Representative of efforts to improve the environment was a trash "harvest" in Madison County, Ala. With the goal of making the county "the cleanest in the Nation," 1,500 truck loads of solid waste were collected. More than 6,000 people were involved.

**Pilot Youth Program**

As part of a new nationwide program, a pilot youth program in Wood County, W. Va., was so successful that it has been expanded to 12 counties in that State. A 5-day workshop, attended by 33 juniors and seniors from Wood County's three schools, helped young people to know individual community leaders and their responsibilities.

**Workshops for Spanish-Speaking Americans**

Extension representatives, as chairmen of the State rural development committees in California, Colorado, New Mexico, and Texas, and while holding membership on the Arizona committee, helped conduct three to eight workshops in each of the States for Spanish-speaking businessmen. Workshops were held in a number of locations. Businessmen learned of U.S. Department of Agriculture programs and of business opportunities. These workshops supported efforts of the cabinet committee on opportunities for Spanish-speaking people. Four enterprises were initiated and implemented as a direct result of the meetings in Colorado.

**Clergy Education**

Twenty-three universities now conduct clergy community education programs. There are also regional schools for clergy continuing education at four land-grant universities. Extension workers serve on the National Committee on Continuing Education for Clergy at land-grant and State universities.

**New Community Programs**

Funds were released in December to enable the State Extension services and experiment stations to begin research and carry out the education component of the Rural Development Act of 1972. Title V of the Act would employ public and private institutions of higher education in providing support for rural development. Each State has a rural development advisory council to review and approve annual plans of work for the 3-year program. A special multi-State regional program will also be carried out in four regions of the country.

### Forest Service

Based on recommendations of an interagency task force appointed in March of 1973 by the Secretary of Agriculture and Dr. John T. Dunlop, Director of the Cost of Living Council, the goal for the volume of timber to be sold from national forests was raised to a level of 11.8 billion board feet for 1973, as well as for fiscal year 1974.

Preliminary estimates indicate that the 1973 calendar year goal was exceeded by almost 1 percent, with sales of 11,907,500,000 board feet. This figure is well within the annual allowable cut of over 13 billion board feet, the allowable cut being the figure that permits sustained yield management of timber resources in the national forests.

The Nation's demands for timber are increasing much more rapidly than supplies. If conditions do not change, this means rising prices for timber and timber products, as well as increased dependence on imports and substitute materials. But this outlook can be changed if the Nation takes advantage of opportunities to increase and extend supplies.

These are the basic findings in the latest 10-year report by the Forest Service (FS) on the Nation's timber situation entitled "The Outlook for Timber in the U.S."

Prospective imbalances between timber demands and supplies, under conditions presently prevailing, will result in increased costs to consumers for houses and other wood products, but the report indicates that this is not inevitable. With intensive management forests in the United States are capable of producing twice the volume grown today.

This can be achieved by intensifying management on all classes of forest ownerships, with major possibilities for increased production on the 60 percent of the Nation's commercial forest area in small private ownerships. The timber situation states that growth can be substantially increased on these lands with adequate technical and financial assistance. It also concludes that increases are possible from national forest and forest industries lands. The report says these increases can be made while maintaining the quality of forest environment and providing for recreation and other uses of the forest. In addition, the report points out that considerable extension of the timber supply can be realized by better and more complete use of timber now harvested from the Nation's forests, both public and private. The report emphasizes that an efficient action program for increasing timber production is dependent on a strong research program which would develop the new technology needed.

### Forest Research

Typical of such research is a new Forest Service program to discover ways for increasing forest production in the Eastern United States established in Asheville, North Carolina. The Forest Service believes efforts to increase supplies should be concentrated in those areas and on those species which promise the greatest biological potential for increased production. The Asheville project will seek to identify areas and soils on which intensive culture for timber can be conducted without damage to the wildlife, recreational, and esthetic values. With this knowledge, cultural practices can be applied to increase timber supplies while freeing many acres of land for other uses and benefits.

In the area of technological advancement, the Forest Service has successfully used the first operational model of a laser beam system for surveying property lines. Developed for the Forest Service by the Goddard Space Flight Center, National Aeronautics and Space Administration, it could save the Federal Government millions of dollars. The "laser range pole" system was designed to allow direct projection of straight lines between adjacent property corners, whether terrain is mountainous or heavily forested. Thus, surveyors can "sight" directly between two points a mile apart, no matter how rough the terrain or how dense the forest. Operational tests in Colorado recently showed the system was accurate within 3 inches over a mile course. In the 187 million acres of National Forest System land, many of the forest system property lines have not been located adequately and many surveys controlling property lines are as old as a 150 years. The Forest Service estimates that its rate of survey by present methods—about 2,000 miles a year--would require as much as 24 years to bring surveys up to date and would cost more than $100 million. With the new system, the job may be done in 12 years at about a third of the cost. The prototype model has worked so well in pilot field survey operations that plans have been made to buy production models during 1974.

### Aid for Lumber Production

Meanwhile, the Forest Service helped stretch the Nation's timber supply by accelerating its sawmill assistance program in 1973. Additional teams of Forest Service and State forestry mill analysis specialists are working with cooperating mills in 32 States to increase lumber recovery. Analysis of mill production can frequently show up trouble spots or inefficiencies not recognized in the day-to-day operation. The analyses can point to a need for more or different machinery, or alternative techniques. Mill participation is on a volunteer basis, and data obtained from individual mills are held in confidence. The accelerated program should help increase softwood lumber production.

### Mining Regulations

Our multifaceted national forests provide the Nation with more than lumber. With more prospectors looking for new gold, copper, lead, and other mineral deposits, new regulations have been proposed to protect the environment when exploration or mining takes place on lands managed by the Forest Service. The regulations would apply to the 140 million acres of national forest land, including wilderness, that are subject to location and entry under the U.S. mining laws of 1872. The search for new resources has intensified, with more pressure to dig mines deeper and to strip-mine low-grade deposits near the surface. The new regulations are being proposed to meet environmental responsibilities, to clearly define the obligations and rights of mineral operators, and to insure the future productivity of renewable national forest resources.

The proposed regulations were printed in the Federal Register, gas, and coal deposits, which are already regulated under the Mineral Leasing Act of 1920. They would require miners and prospectors to spell out in advance how they plan to search for or develop deposits, and to submit a plan for restoring the surface of explored or mined areas to a natural looking state within a year or less (provided that a longer period is not allowed by the Government). Miners and prospectors also would be required to post a minimum bond of $2,000 to insure the restoration work.

At present, prospectors and miners may bulldoze an area to explore for near-surface mineral deposits or leave mine spoils or tailings in piles where they can run off into streams or lakes. The Forest Service has control over access roads to prospecting and mining sites, but can only try to persuade miners to take steps to protect the environment. The proposed regulations would require miners and prospectors to clear these operations in advance and to restore areas when they have finished.

The proposed regulations were printed in the Federal Register December 19, 1973. Written data, views on, or objections to the proposed regulations are being submitted to the Forest Service. A final environmental impact statement on the proposed mining regulations was to have been submitted to the Council on Environmental Quality before the regulations were put into effect.

### Forest and Rangeland Grazing

Forests and rangelands, both public and private, will also provide grazing for the animals which can bolster our Nation's food and fiber supply to meet rising consumption. In a study conducted by the Forest Service, other Federal agencies, and the University of Nebraska it was indicated that ample forage for cattle and sheep can be provided from the various forest rangeland holdings. At the same time these holdings can protect other values of the grazing land—at management costs per unit of output comparable to today's costs. This would call for more intensive management on the best grazing lands.

The study covered all present or potential forest-range grazing lands (1.2 billion acres) –both public and private–in the contiguous 48 States. It shows 835 million acres, equivalent to year-round forage for 17 million adult cows a year, are presently being grazed by livestock during part or all of each year (producing 213 million animal-unit months). (An animal-unit month is the forage grazed by a cow each month.)

Based on estimates of future consumption, population, and so forth, the study predicts that the demand for range grazing to fulfill meat and wool needs will increase by 20 percent in 1980 over 1970. By the year 2000, the estimated increase is 50 percent above the 1970 demand.

Off-Road Vehicle Controls

The national forests provide recreation, but the need for regulation of recreation areas has become apparent. By the end of 1976, owners of off-road vehicles--dune buggies, amphibians, scooters, four-wheel drive and all-terrain vehicles--will find designated areas and trails in the National Forest System lands where they may and may not operate. Supervisors of the 155 national forests have until December 31, 1976, to establish places where off-road vehicle use will be allowed, curtailed to some degree, or prohibited. Before final decision is made, the public will be given an opportunity to participate in the designation or revision of designation where restrictions or closures are involved. The proposal for designation for full, limited, or nonuse by off-road vehicles is an outgrowth of a 1972 executive order requiring that a system for controls be set up to minimize damages to natural resources, protect public safety, and reduce conflicts among users on public lands.

The regulations are needed because of the explosive increase in use of off-road vehicles. Approximately 8,000 of the 80,000 miles of trails outside wildernesses and primitive areas are now closed to avert resource damage or to provide for special uses, such as hiking areas, nature trails, national scenic trails, trails leading to wilderness, and trails limited to travel by foot and horse.

Off-road vehicles are presently banned from 14.5 million acres of wilderness and primitive areas and from about 4.8 million acres in 395 other special purpose or damage-prone areas. Limitations will not apply to authorized vehicles under permit, lease, license, or contract; to military, fire, emergency, or law enforecement vehicles; to official vehicles; nor to vehicles used for prospecting or mining under provisions of the General Mining Law of 1872. The exception for prospecting and mining was included because the Forest Service is in the process of issuing revised mining regulations that will, in part, be designed to minimize adverse impacts from vehicle use in connection with mining operations.

Wilderness Studies

As a result of a 2-year review, inventory, and evaluation of national forest roadless areas, the Forest Service has selected 274 national forest areas covering 12, 289,000 acres in 14 States and Puerto Rico for study and possible inclusion in the wilderness system. The list of areas to be studied was expanded from an initial proposed list announced in January, which covered 235 areas and

11 million acres. Public response to the proposed list and other factors led to the increase in both number of areas and acres. All but 3 of the 274 areas are in the West. The eastern areas to be studied are 22,000 acres in Bradwell Bay National Forest in Florida, 14,935 acres in Joyce Kilmer-Slickrock National Forest in North Carolina, and 8,488 acres in El Cacique National Forest in Puerto Rico.

Acreage in each of six of the Western States–Alaska, Colorado, Idaho, Montana, Washington, and Wyoming–exceeds 1 million acres. The greatest study acreage in any one State is the 2.5 million acres in Alaska, which presently has no designated wilderness. Studies have already been started on some of the areas, but the bulk of the project will wait until after other studies have been completed on Forest Service primitive areas. Congress has required that studies of 34 national forest primitive areas for possible inclusion in the wilderness system be completed by September 1974.

Identification of the new study areas does not preclude the opportunity for still other areas to be considered for study during the normal land-use planning process by each national forest. There are 56 million acres of roadless and undeveloped areas in the national forests. The list of study areas climaxes a 2-year review process which involved more than 300 public meetings attended by over 25,000 people to compile the initial list, and 8.000 written comments and suggestions related to the proposals in the draft environmental statement.

The States with wilderness study areas, the number of study areas in each State, and the acres covered by the study areas follow: Alaska, 6 study areas, 2,567,000 acres; Arizona, 20 areas, 398,537 acres; California, 22 areas, 990,910 acres; Colorado, 52 areas, 1,768,165 acres; Florida, one area, 22,000 acres; Idaho, 33 areas, 1,627,649 acres; Montana, 36 areas, 1,551,589 acres; Nevada, 7 areas, 184,511 acres; New Mexico, 24 areas, 426,994 acres; North Carolina, 1 area, 14,935 acres; Oregon, 12 areas, 262,020 acres; Puerto Rico, 1 area, 8,488 acres; Utah, 11 areas, 355,965 acres; Washington, 25 areas, 1,022,120 acres, and Wyoming, 29 areas, 1,092,961 acres. These listings of study areas total more than the actual number of study areas because some study areas embrace more than one State. However, the acreages listed are totals for all areas and parts of areas within individual States.

The Forest Service dedicated its 100th research natural area on May 3, 1973, near Brookings, Oreg. These areas are designated to preserve typical or unusual plant and animal communities or geologic features to provide outdoor classrooms for researchers and others interested in the study of the natural environment. The Wheeler Creek Research Natural Area, a 334-acre stand of coast redwood near the northern limit of its range, will be used for scientific study, research, and educational purposes.

### Funds Distributed

The multipurpose use of land under Forest Service supervision resulted in a collection of $455,216,805 from users of U.S. national forest products and services for fiscal year 1973. Thirty-nine States plus Puerto Rico received more than $114 million of it. The three west coast States, sources of most of our national forest timber supplies, were given checks totaling $87,388,328—Oregon, $42,471,875; California, $27,520,688; and Washington $17,395,765.

By law, the money must be spent for public schools and roads. Payments to the 40 jurisdictions containing national forests represent 25 percent of total receipts from fees for grazing, recreation (including admission and user fees), power, minerals, and other land use, and sale of timber. The "25-percent fund" goes to States and Puerto Rico for redistribution to counties in which national forests are located, or for expenditures to benefit such counties.

The latest disbursement pushes to more than $1 billion the amount given to non-Federal jurisdications since the Service was formed in 1905. Total Forest Service user receipts since 1905 exceed $4 billion. Increased receipts from timber sales were primarily responsible for the payment to States being $29 million higher than that in fiscal year 1972, when it totaled $84.6 million.

### Controlling Tussock Moths

On April 20, 1973, the Environmental Protection Agency announced that it had denied a request by the Forest Service and the States of Oregon and Washington to use DDT on an emergency basis to control an outbreak of the Douglas fir tussock moth which had been wreaking havoc in the forests. In a draft environmental statement sent to the Council on Environmental Quality 3 months prior, the Forest Service's tussock moth pest management plan proposed an integrated program of natural biological control agents and chemicals in combination with salvage logging of timber in the seriously affected areas. These control measures would be followed by reforestation. However, based on the EPA decision, DDT was not included as an alternative method of control in the final statement.

The request by the Forest Service and the State government had asked permission for emergency use of DDT during the month of June to kill the insects before they have time to kill more of the trees. However, it was felt that the tussock moth epidemic might collapse during 1973 from the effects of a naturally occurring virus. The history of such buildups during past infestations is that during the third year the populations collapse, probably as a result of the virus.

The Environmental Protection Agency ruled against use of DDT on the grounds that the moth population probably would collapse, and that the effects of the DDT could be contaminating to air and water. At the time, EPA said the benefits wouldn't outweight the risks. The Forest Service's request for approval noted that the virus epidemic could extend into 1974.

In December 1973, the Service filed a draft environmental statement on the possible need for control of the Douglas fir tussock moth during 1974 on some 650,000 acres of forests in Oregon, Washington, and Idaho. This was done in cooperation with the Bureau of Land Management, Bureau of Indian Affairs, Oregon State Department of Forestry, Washington Department of Natural Resources, and the Idaho Department of Public Lands. The environmental statement indicated that, on the basis of the latest insect egg mass counts and consideration of all alternatives, it may be necessary to use DDT to control the outbreak in order to prevent widespread damage to the forests and related resources during 1974. However, use of the controversial pesticide was still regarded as one of several alternatives, and a final decision on its use would take into account agency and public response to the draft environmental statement, the effect of a natural virus disease, natural parasite levels in the tussock moth population, and other factors which may yet cause the outbreak to collapse.

In addition to control efforts, research in 1974 will involve field tests of a virus, a bacterium, and one or more chemicals. Scientists have developed a formulation of a natural virus and a bacterium which have shown promising control potential. These tests are part of a full-scale effort to assure more effective control of future epidemics and to eliminate the necessity of using persistent chemicals. Congress has appropriated supplemental funds for use in fiscal year 1974 to expedite this research and to salvage timber killed as a result of earlier defoliations by the tussock moth.

Publications

In 1973 the Forest Service also issued a new handbook summarizing present knowledge of methods for harvesting, regenerating, and maintaining 37 major forest tree types in the United States. The 124-page book, "Silvicultural Systems for the Major Forest Types of the United States," includes discussion of the importance of wildlife, recreation, and water considerations, as well as timber, in the choice of forest culture systems. At the same time the Service issued the first of two booklets designed to provide guidelines for making esthetics a major consideration in planning land-management actions on large forest landscapes. Volume one of the series, "National Forest Landscape Management," is a training text to be used as a basic manual for identification of visual characteristics of the landscape and analysis of visual harmony. Specific field application of the concepts in this booklet will be described in more detail in volume two of the series, now in preparation.

### Soil Conservation Service

In times of growing demand for America's agricultural production, the historical role of the Soil Conservation Service (SCS) in helping conserve this Nation's precious resources, especially of soil and water, takes on even greater significance. In the fall of 1973, SCS was asked to give first priority to helping farmers select acreages for intensive farming that could be protected adequately from soil erosion. At the same time, a large number of local planning boards, zoning authorities, and land developers, struggling with the problems of rapid urban growth and land use changes, also requested technical assistance from SCS.

Help Through Conservation Districts

Much of the work of the Soil Conservation Service is channeled through the 2,962 conservation districts of this Nation. Through them SCS helped prepare more than 71,700 conservation plans covering more than 26 million acres and helped revise more than 31,000 plans covering 19.1 million acres. More than 602 million acres of non-Federal land in the United States now are covered by conservation plans that help to insure resource protection and proper land use. During the year, SCS provided 2.7 million technical services to 1.1 million individual landowners and users in conservation districts. Conservation districts, by the end of the year, had more than 2.2 million cooperators who were applying and maintaining soil and water conservation practices on 778.1 million acres, an increase of more than 3 million acres. Today farmers are not the only persons who actively take part in conservation district activities; lawyers, housewives, engineers, businessmen, and people from all walks of life participate.

**Help to Governments**

Meanwhile, SCS has provided many local and State governments with natural resource information and has assisted them in preparing plans and programs. In 1973, SCS provided more than 123,000 technical services to 30,433 local and State governments and their agencies. More than 16,900 natural resource inventories and evaluations were prepared with SCS help, for an 8.8-percent increase over 1972. In providing resource information about soil limitations and other site hazards, SCS helped units of government to select more than 2,100 sites for public facilities such as schools, parks, and hospitals. SCS and conservation districts provided resource facts that helped several States formulate erosion and sediment control legislation.

**Watershed Protection and Flood Prevention**

During fiscal year 1973, the latest 12-month period with statistics completed, 18 multipurpose dams, 141 floodwater retarding dams, and nonstructural water management and sediment control measures were installed in P.L. 566 watershed project areas. An additional 40 floodwater retarding dams were constructed in watersheds covered by the 11 flood prevention projects which were authorized by an earlier act. In line with an increasing public recognition of environmental values, some of the older projects were modified to eliminate a total of more than 550 miles of projected channel improvement work. In some cases, ponds, marshes, and other wildlife features were added.

In planning watershed projects, special consideration is given to alternatives that eliminate or greatly reduce anticipated adverse environmental impacts. The stress placed on environmental quality and the careful consideration of alternatives have slowed the work but have resulted in better and more comprehensive plans. During fiscal 1973, Federal assistance in planning, preconstruction, or construction work was furnished by SCS to sponsors of 957 watershed projects. Initial agreements for construction were signed for 33 projects in 18 States. Twenty-eight applications for watershed assistance were submitted. Since P.L. 566 was initiated, a total of 1,676 projects have been authorized for assistance and a backlog of 1,258 unserviced applications remains.

**River Basin Studies**

Eleven of the Soil Conservation Service's 56 cooperative river basin studies were initiated in 1973. In one of the 44 States in which these studies are underway, a study is providing the basic information needed to carry out the State's wetlands legislation. In Massachusetts, a similar study is helping to identify valuable reservoir sites. The Iowa Legislation recently divided the State into six conservancy districts, one of which, the Iowa-Cedar Conservancy District, is sponsoring a cooperative study of its area. Iowa has requested similar resource studies in each of the other five districts.

In cooperation with the Metropolitan Sanitary District of Greater Chicago, SCS is participating in the Chicago Metropolitan River Basin Plan, which includes flood control plans for six areas.

The Governor of Tennessee has requested the Obion-Forked Deer River Basin Study, which focuses on a flood plain area where there is controversy over resource use and development. In West Virginia, SCS and the U.S. Army Corps of Engineers are jointly studying the Pocatalico River Basin in response to a U.S. Senate public works committee resolution for a plan to meet critical water supply shortages in several rural communities. A joint interim report has been prepared and sumitted for Congressional authorization and implementation. One comprehensive framework study, the Lower Mississippi Regional Study, is currently underway and is scheduled for completion in this fiscal year. A total of eight comprehensive detailed studies are in progress. Two of these, the Hawaii and Connecticut supplemental studies, were initiated in fiscal year 1973.

The nationwide interest in flood plain regulation and land use planning is creating more and more demand for SCS assistance in flood hazard analyses. In fiscal 1973, five more States began participating in the flood hazard analyses program and five studies were completed. At the end of the year 23 States were participating and 66 studies were underway. Flood hazard reports have been published on 13 of the studies. These reports are being used by local communities, counties, and the States as a basis for land use planning and for regulating the use and development of the flood plain.

SCS undertook three special tasks for the Department of Housing and Urban Development late in fiscal 1973: (1) A type 21 study —listing all flood or mudslide-prone communities in each State; (2) a type 22 study—compiling maps of the flood or mudslide-prone communities in each State (more than 15,000 communities were found to be flood prone, and a small number of these were also subject to mudslide); and (3) type 7 studies—delineating flood-prone areas using 100-year flood experience information. Total value of all reimbursable studies initiated for HUD in fiscal 1973 was more than $1.5 million.

### Resource Conservation and Development

During fiscal 1973, some 25 new resource conservation and development (RC&D) projects became eligible for assistance. The 25 new multicounty projects are in 26 States: Alabama, Arizona, California, Colorado, Indiana, Kansas, Kentucky, Maine, Michigan, Mississippi, Missouri, Montana, New Jersey, New York, North Carolina, North Dakota, Ohio, Oregon, South Carolina, Tennessee, Texas, Utah, Vermont, Virginia, Wisconsin, and Wyoming. RC&D program assistance is now provided in 123 project areas, which include 974 counties or 615,245,300 acres. All States except Alaska are involved in RC&D project activities.

In carrying out these projects to improve the use of each area's natural resources, sponsors adopted 3,519 measures and completed 198 in 1973. Community-type measures completed with RC&D financial and technical assistance included those for erosion and sediment control, flood prevention, public water-based fish and wildlife and recreation developments, educational training, industrial development and expansion, and marketing improvements.

### Great Plains Conservation Program

Under the Great Plains Conservation Program, some 2,565 farmers and ranchers signed contracts to apply wind and water erosion control measures on 4.3 million acres during fiscal 1973. Under these contracts, about 21 percent of high-risk lands now used for tilled crops will be converted to grassland. More than 45,100 farmers and ranchers have now entered into long-term contracts covering 81.7 million acres. Of this number, 26,413 contracts have been successfully completed, 2,407 were terminated for various reasons, and 16,330 are still active.

At the end of the fiscal year, 7,200 unserviced applications for contracts were on file in the 469 counties eligible for participation in the Great Plains Conservation Program--a backlog higher than in any year since program operations began in 1957.

Technological Development

In 1973, there was increased emphasis on providing field personnel with updated knowledge on waste management systems. This included the role of plants, the behavior of plant nutrients and pesticides, and the management of plants in water management systems.

SCS gave onsite assistance to landowners in the installation of 3,800 agricultural waste management systems in 1973. The systems involved structures such as lagoons, holding ponds, and waste storage facilities, and to many conventional soil and water conservation structures. With implementation of Public Law 92-500 (Federal Water Pollution Control Act Amendments of 1972), requests for technical assistance in agricultural waste management are expected to increase rapidly. Demand already exceeds available manpower in many areas of the country.

To help the Nation's livestock producers grow greater amounts of high-quality forage on native grazing lands, planned grazing systems were installed on 6 million acres of rangeland during fiscal 1973, bringing to nearly 50 million acres the amount of grazing land with up-to-date grazing systems. Many reports of 50-to 100-percent increases in rangeland production, with corresponding improvement in erosion-resistant plant cover, indicate the effectiveness of grazing systems which are carefully tailored to individual ranching units. More than 12 million acres of rangeland were improved by deferred grazing, and 420,000 acres of eroding land were seeded to rangeland plants in fiscal 1973. Plant cover was improved on some 4 million acres. The selection of improved plants for agricultural conservation practices continued.

New plants released by SCS, cooperating agencies, and State experiment stations during 1973 included:

'Rosana' western wheatgrass--for range reseeding, roadside stablization, and mine spoil reclamation in the northern Great Plains.

'Midwest' manchurian crabapple--for windbreaks, shelterbelts, roadside beautification, and wildlife food and cover in the Midwestern States.

'Cave-in-Rock' switchgrass--for summer pasture, waterways, mine spoil revegetation, and wildlife plants in the southern Corn Belt.

'Pink Lady' winterberry euonymus--for roadside stabilization and beautification, windbreaks, and wildlife habitat improvement in the southern Great Plains.

'Arriba' western wheatgrass--a variety adapted to the southern Great Plains.

'Redondo' Arizona fescue--for stabilizing ski slopes and other critical areas at high altitudes in the Rocky Mountains.

'Bandera' Rocky Mountain penstemon--a flowering forb for erosion control and beautification along highways.

SCS environmental improvement work for wildlife was impressive in 1973. SCS specialists helped landowners across the country improve more than 9.6 million acres of land and water for the specific benefit of wildlife--a 27-percent increase over 1972. In addition, stripcropping, range improvement work, pond building (43,056 in 1973), and other wildlife-benefiting practices improved millions of acres of land.

Another SCS goal is to help with the planting of 5 million acres of trees by 1983. In fiscal year 1973, district cooperators planted approximately 366,000 acres. This was less than the amount planted last year mainly because conditions during the planting season were unfavorable and planting stocks were low. All indications, however, point to an increase in 1974.

Other woodland conservation accomplishments in 1973 include 384,719 acres of woodland improvement and 1,515,762 acres of improved harvesting. The 2,362 miles of field windbreaks that were planted will help increase food production, and the 42,418 acres of farmstead and feedlot windbreaks will add to the living comfort of farmers, animals, and live-in wildlife.

*Snow Surveys.* In fiscal 1973, the people living on more than 9 million acres of irrigated land directly benefited from 2,412 water supply forecasts made at 465 locations along western mountain streams. The current network for snow measurement and related data includes 1,600 mountain snow courses, 200 aerial markets, 200 soil moisture installations, and 300 mountain precipitation gages. A prototype system of automated sensing devices for data collection and transmittal via radio telemetry has been installed at about 40 sites. In 1973, preliminary plans for converting approximately one-third of the manually measured sites to automated sites were completed for each of the 10 Western States. An agreement was signed with the National Weather Service to permit use of the Geostationary Operational Environmental Satellite (GOES) as a radio relay station for three automated sites. The satellite is scheduled for launch early in 1974.

*Soil Survey Operations.* As SCS continued to meet the needs of land users in fiscal 1973, detailed soil survey mapping was completed on about 38.4 million acres and reconnaissance soil survey mapping was completed on about 8.5 million acres. In addition, exploratory soil survey mapping was completed on 63 million acres in Alaska. The cumulative total for all soil survey mapping completed by the end of the fiscal year was about 1.2 billion acres, or 52 percent of the total land area of the United States and the Caribbean area.

During the year initial soil survey field reviews were made on 63 soil survey areas, progress soil survey field reviews on 375 soil survey areas, and final field reviews on 78 soil survey areas, for a total of 516 field reviews. Some 447 special soil interpretive reports also were prepared and made available to local users. Soil survey appraisals were made in 19 States during the fiscal year. At the end of the fiscal year, soil surveys were being made progressively in 748 areas and nonprogressively in 988 areas. Soil survey mapping has been completed on an estimated 72 percent of areas in the Nation where housing is increasing and industry rapidly expanding.

In fiscal 1973, 90 soil survey manuscripts (an alltime high) covering 46.9 million acres of land were sent to the Government Printing

Office for publication, bringing the total mapped acres to more than 860 million. Soil interpretations for more than 1,200 soil series from all parts of the country have been entered into computer storage at the Statistical Laboratory, Iowa State University. These data will be tied into the Conservation Needs Inventory (CNI) data to make the CNI more useful. In addition, tables for soil survey manuscripts are being produced from interpretation data on a trial basis and will be available for general use soon.

A pilot study for automating soil survey manuscripts was successfully completed at Fort Worth, Texas. The techniques being developed may be extended to other technical service centers.

In line with SCS objectives of making soil survey interpretations available for decisionmaking on a wide variety of land uses, States are using automatic data processing systems such as Map Information Assembly and Display System (MIADS) for producing interpretation maps by computer. These computer-printed maps are useful to area and regional planners in making decisions and in informing the public about soil-related problems.

*Land Inventory and Monitoring.* The demand for resource data interpretations for different land users is extremely high. Last year SCS provided more than 16,000 resource inventories and evaluations to units of government or their agencies having responsibility for resource planning. In addition, more than 400 special soil reports with interpretations were prepared. SCS has taken steps to carry out its assigned responsibilities to inventory and monitor the Nation's soil, water, and related resources. The Land Inventory and Monitoring (LIM) Division was established to provide program leadership. SCS - and USDA-LIM advisory groups assist in formulating programs, and arrangements have been made with the U.S. Geological Survey to coordinate closely related programs.

In addition, five task forces are now preparing definitions and developing new procedures for surveying, inventorying, and monitoring wetlands, flood plains, and prime and unique farmlands; erosion and sediment damages; and soil and water conservation reporting practices. The objective of LIM is to provide landowners and users with data on (1) kinds, amounts, and locations of soil, water, and related resources; (2) suitability or limitation of those resources for various uses; and (3) changes and trends in the use, extent, and condition of those resources for conservation, development, community planning, and environmental improvement.

## Economic Research Service

The missions of the Economic Research Service (ERS) are to develop and disseminate economic information related to domestic and world agriculture and to rural America, and to coordinate and give leadership to the USDA training and technical assistance programs for low income countries. Information sought includes both short-term outlooks and longer range projections. In 1973 the demand for short-term outlooks soared, as those in agriculture, government, and the news media attempted to understand and react to fast-paced events. Assessing these events was a major challenge to short-term analysis.

In addition to issuing the regular series of outlook and periodic reports and answering a heavy flow of inquiries from the public, ERS made many special studies of the fast-developing situation for other agencies. Requests came from other USDA agencies, the Cost of Living Council, Council of Economic Advisers, Price Commission, other Government agencies, and Congress. Deadlines for these analyses, often involving several policy alternatives, frequently were a matter of hours or days.

### Research Reorganized

While seeking the answers to public and other Government agency inquiries, ERS was also scrutinizing its own ability to respond to changing research needs. On July 1, reorganization of the agency became effective. Greater flexibility is now possible in addressing new problems and issues, resulting in economic information that is more timely and relevant.

Domestic food and fiber research is now handled by two divisions, instead of three. The commodity economics division focuses on analyses of individual farm commodities and on studies of major crop and livestock subsectors. The national economic analysis division examines such areas as adjustments and performance of the food and fiber system having an impact on farm income, marketing costs, and services to consumers.

Organizational barriers have been lowered to encourage team research and to permit more effective research management. Using management-by-objectives concepts, agencywide research goals are being established. As part of reorganization, ERS is strengthening its research program and working relationships with universities and agricultural experiment stations.

ERS has also accommodated organizational changes of other USDA agencies. On July 1, ERS gained its own information division, formerly a part of the Office of Management Services of USDA. The economic development division of ERS was shifted into the newly created Rural Development Service late in 1972. After the groundwork for the administration of the Rural Development Act of 1972 was established, the regulations published, and the coordination functions required by the Act were designed and in the initial stages of operation, this division was returned to ERS, effective December 4, 1973.

The following five sections summarize significant findings obtained in 1973 from each of the major research program areas.

### Research to Improve Farm Income

Expiration of the Agricultural Act of 1970 opened debate on the best course for future farm policy. ERS projected the probable impact of four possibilities on agricultural production, farm income, retail food prices, and Government costs through 1977. These four possibilities were (1) a return to basic legislation, (2) deficiency payments, (3) general cropland retirement, and (4) several modifications of the 1970 law. The results provided essential information for Congress and the Administration in formulating the Agriculture and Consumer Protection Act of 1973.

Even though per capita beef supplies slipped by 6 pounds in 1973, raising concern at times about a meat scarcity, an ERS study utilizing the opinions of beef industry experts projected increased beef production by 1980. Given prices high enough to stimulate expansion, beef cow numbers would increase nearly 10 million during the 1970's and imports would rise, boosting per capita beef supplies to 127 pounds in 1980, compared to 114 in 1970. Major herd expansion would be expected in the Southeast, Northern Plains, and Corn Belt.

Farming was the primary activity of one-third of 411 firms directly involved in agricultural production and having farm sales of $1 million or more. Primary sales of firms constituting the other two-thirds were about evenly divided among activities involving supply of farm inputs, processing of farm products, distribution of farm products, and production of nonagricultural goods. Beef cattle, vegetables, fruits, and poultry were the leading farm money earners for the 411 firms. The role of these big businesses and implications of their farming operations are under further study.

With the continuing escalation in average farm values, the graduated Federal death tax presents problems in keeping the family farm intact. It can total a tenth of the worth of a large farm estate, and few estates have enough liquid capital to pay the tax without cashing in property. Research continues to evaluate alternatives (such as the underused gift transfer rules) and to suggest reforms.

Recent net returns per acre after taxes averaged 6 percent on very large western wheat farms, as compared to an average of 5 percent for all units studied. Large wheat farms have some advantage over smaller operations because of their discounts on purchased inputs and in obtaining premium prices when marketing grain. More large wheat farms are likely, as farmers seek to use the competitive edge they offer. But net returns are believed to be too low to induce nonfarm investors to put their money into wheat farming.

Harvesting California's cling peaches is still largely a hand operation requiring nearly 3 million hours of labor a year. In 1970 only 10 percent of the crop was harvested mechanically. But an ERS study suggests more machine harvesting is on the way. At 1970 wage rates, mechanical harvesting would pay off for producers with over 37 acres of mature peaches. With wage rates a fourth higher, mechanization would be profitable for producers with over 29 acres.

Marketing efficiency is monitored, and food industry factors that affect it are researched. Sharply increasing food prices, along with the imposition of wage and price controls that limit wage increases and profit margins in the food industry, heightened concern over the performance of the food industry in 1973.

Research was begun in fiscal year 1973 to delineate the cost and profit components of margins charged at each processing and distribution level for selected individual food items, including beef, pork, bread, milk, apples, and oranges. With additional funds made available by the Congress, this work was expanded in fiscal year 1974. Measuring labor and other costs incurred, as well as profits earned by agencies at various marketing levels, also may point to areas for possible cost reduction through changes in marketing practices that will increase efficiency.

Two studies will be made in support of the regulatory mission of the Commodity Exchange Authority. One will focus on the problems of detecting and preventing futures price distortions and the adequacy of current trading rules. The second will recommend improvements in the reporting systems used to gather trading data for regulatory purposes.

**Foreign Agricultural Review**

During 1973 the agricultural situation in other nations was somewhat similar to our own. Harvests increased and plantings were up, pointing to even further production gains for the 1973/74 season. But stock levels of farm commodities were sharply reduced following the smaller world harvest of 1972, so total supplies remained very tight.

World price levels rose sharply although continuing currency realignment effectively lowered the prices that some nations paid for imported farm goods from major suppliers such as the United States. World agricultural production (excluding production in Communist Asia) rose about 6 percent to a record high in 1973, recovering from the poor harvest of 1972. Improved weather was mainly responsible, and the Asian monsoon was particularly favorable. Production rose notably in the United States, Canada, the USSR, India, Latin America, and Oceania.

World food production (excluding production in Communist Asia) rose to a new high in 1973, and per capita output of food equaled the record high of 1971. Total production rose about equally in the developed and less developed countries. However, because population increased much faster in the less developed countries, they had smaller increases in per capita food production.

In 1972 much attention was focused on declining grain output in the USSR, a result of weather setbacks. In 1973 the weather there was excellent, and gross grain production zoomed to 222 million tons, an increase of 20 percent over the previous record. With an expected surplus of grain over consumption during 1973/74, the USSR's rebuilding of depleted reserves may receive a top priority.

**Farm Export Research**

Output of grain, especially of feed grains, is growing fast enough in Western and Eastern Europe to accommodate livestock and population increases. Between 1970 and 1980 Western Europe's corn production is doubling, with France as a leader; net corn imports for the region will drop from the current level of about 13.5 to 12 million tons by 1980. The United States has supplied about 60 percent of the region's corn imports.

Although Eastern Europe will boost its feed production, there will be a growing opportunity for the United States to export oilseed products to this region for use as high-protein feed supplements. The progress of crops in the Soviet Union during 1973 was closely monitored, and analysts worked closely with other experts in the Department to evaluate the impact of good crop production on Soviet import requirements. A study of the longer term prospect for the Soviet feed-livestock economy is underway. Preliminary results indicate that, despite expectations of major advances in the level of grain production, a sizable gap between Soviet feed energy requirements and availabilities from domestic production is likely to occur during the next decade if a livestock program reasonably consistent with consumer demands is to be sustained.

### Devaluation and Farm Exports

About four-fifths of U.S. farm exports go to nations where, as a result of the dollar depreciation, foreign currencies could be cheaper than they otherwise would have been. However, not all of our exports to these nations are free to benefit from dollar depreciation because the effects may be largely or fully offset by nontariff barriers. After discounting the effects of these barriers, prices for U.S. farm exports were found to be 8 percent lower than they would have been in the absence of the 1971-73 devaluations.

### Technical Assistance to Foreign Countries

In fiscal 1973, some 355 USDA specialists advised developing countries on all phases of agricultural development, from economic planning to soil erosion control practices. In addition, the Department arranged more than 9,600 man-months of U.S. training for 2,828 foreign agriculturists. USDA's technical assistance and training activities are sponsored primarily by the U.S. Agency for International Development, although there is growing sponsorship by organizations such as the Food and Agriculture Organization, World Bank, and Inter-American Development Bank. With developing nations growing in self-sufficiency, some host countries now pay for USDA technical assistance.

In 1973 there were fewer USDA resident advisers overseas than the Department previously had. This reflects reductions in U.S. foreign aid staffs abroad as well as development of basic skills and institutions in low-income countries. Emphasis is now on using short-term consultants to solve specific problems.

Some of the highlights of 1973 technical assistance programs follow.

*Economic Research Assistance.* So low-income countries can use their scarce resources to best advantage in development programs, ERS specialists helped several nations improve their capabilities for economic analysis, planning, and policy formulation. ERS work in Vietnam, for example, produced prime information for developing that country's postwar reconstruction plan.

*Research To End Need for Aid.* ERS research showed how Vietnam can earn development funds by competing for export markets, thus reducing its need for foreign aid. A similar project identified commodities for Latin American export expansion. Marketing improvement projects in El Salvador and Honduras prompted expansion of the program to regions to spur economic growth through accelerated trade. A project in Panama established a system for forecasting livestock and crop data to help farmers produce and market commodities when and where they are needed. There were similar projects in Colombia and the Dominican Republic as well.

*Courses in Management and Policy.* Major accomplishments in international training featured management and policy courses to supplement training in production techniques. Successful development programs in developing nations require skillful managerial ability. In Turkey, Turkish instructors were used for two USDA-assisted courses in training government executives in management procedures. Many of these instructors were trained in four earlier U.S. sessions. Another course on middle management trained 20 officials who will in turn conduct training programs in Turkey.

Courses on evaluating development alternatives and preparing proposals for international financing were held in Washington, Turkey, Guyana, Jordan, and the Dominican Republic to help low-income nations plan effective development activities and obtain needed financial support. An agricultural policy seminar, involving 16 officials from 11 nations, pointed out how agricultural policy decisions affect overall social and economic development and some of the considerations necessary to balance a nation's resources with its needs.

### Environmental and Resource Development Research

The increased demand for U.S. farm products has led to farming more land and the use of more inputs to increase yields, raising the potential for pollution. Actual and proposed restrictions on the use of chemicals and feed additives, and proposed water pollution controls on animal feeding facilities will increase production costs. Thus, the supply and price of agricultural products would be affected.

Research findings include the following.

- Meeting the proposed effluent limitation guidelines for feedlots would require the animal feeding industry to invest $800 million in pollution abatement facilities. A significant portion of this cost would fall on small- and medium-size producers. The economic viability of those producers with water pollution problems would be threatened. In the short term, reductions in the supply of pork and milk products would occur. Prices would rise as a result of short supply and increased production costs.
- Banning the use of lindane and benzene hexachloride (BHC) to control insects in livestock production would cost U.S. farmers an additional $10.4 million annually. Added costs would also be incurred in crop production if alternative insecticides had to be substituted for lindane and BHC.
- Restrictions on use of medication in feed, under consideration by the Food and Drug Administration, would boost livestock production costs. Total elimination of medication could add $50 million to poultry production costs and over $400 million to livestock production expenses.
- It is technically possible to recycle part of dried animal wastes as feed, but it is too expensive to do so. Only the largest poultry operations could profitably use part of their dry layer waste as feed. Anaerobic or land disposal systems will continue to be the most economical manure disposal methods for the near future.
- In an effort to provide a safe working environment for hired farmworkers, the Occupational Safety and Health Administration (OSHA), Department of Labor, proposed field reentry intervals between the time a crop is treated with specific organophosphate compounds and the time workers can safely reenter treated areas. The OSHA contracted with ERS to conduct an economic impact study of the reentry proposals. ERS found that--

(1) Over 140,000 acres of peaches would incur total annual increase in production costs of $16.7 million. The impact would center heavily on southeastern peach growers.
(2) Shade-grown tobacco production costs could rise $30 to $40 per acre.
(3) For apples, grapes, and citrus, production costs would likely remain unaffected.
(4) Laborers may face brief periods of unemployment until reentry intervals expired.

**Future Land Issues**

In 1973, acreage of harvested cropland increased to 318 million acres, 28 million acres over 1972. Prospects are highly encouraging for sufficient cropland to produce future domestic food needs while continuing to supply expanded foreign markets. If demand continues to boom, as much as 340 to 350 million acres could be available for crop production by 1985, assuming no limitation on crop acreage and favorable cost-price relations for agricultural production. This potential increase in crop acreage could be met by greater use of land now in farms and continuation of cropland development at about the current rate. However, provided productivity continues increasing, long-range projections foresee a leveling off or decline in acreage used for crops, even with some increase in current levels of exports.

**Energy Needs**

Future energy needs will make their mark on rural lands. We have barely scratched 128 billion tons of strippable coal lying under 45 million acres. Three-fourths of this is west of the Mississippi. Strip mining promises to become a critical issue during this decade. Meanwhile, thermal power electric plants will become more numerous in rural areas, generating chemical and thermal pollution and taking 1 1/2 million acres of new right-of-way for power transmission lines within a decade.

**Land for Recreation**

While there is no overall shortage of rural land for recreation (and much of it is of little farming value) there is a pressing need for more recreational land accessible to urban populations. Governments at all levels and commercial developers will continue acquiring land for recreational development, but the greatest impact on rural areas may come from individuals purchasing recreational plots and second-home sites.

**Rural Development Research**

The nonmetro employment growth rate, 1970-73, was twice that of metro areas--2.6 percent nonmetro compared with 1.2 percent. Nonfarm employment presents an even more striking contrast--3.5 percent growth rate in nonmetro areas, 1.4 percent in metro areas.

Even with interest as low as 1 percent a year, ERS found less than 5 percent of the Farmers Home Administration's low-income loans went to families with annual incomes below $3,000. In areas served by FHA, 31 percent of the households that were below the poverty level lacked complete plumbing, compared to only 8 percent nonpoverty households.

ERS studied Pennsylvania communities to find out what rural areas interested in development must do and how to go about it. ERS found that such communities must first identify their economic and environmental goals, then assess what industries are looking for and what the community has to offer prospects. Communities are warned to look at both costs and benefits—social as well as economic–before working to reach their goals. Effective rural development may require planning and cooperation on a multicounty scale to assure that adequate resources and facilities will be available for balanced and sustained growth, and to minimize unproductive competition.

ERS land use specialists point out some critical issues of unplanned development: failure to meet needs for open space, recreational areas, or other amenities; transportation and public service inefficiencies; and spotty or uneven development. Unplanned development may also lead to speculative pricing and idling of good farmland; isolation of farms; and incompatible, unsightly, or objectional land use. Sales of rural land for second homes have increased rapidly. If second-home developments are unplanned and uncoordinated, ERS researchers say they may lead to environmental problems or unanticipated demands on such necessities as water and sanitary facilities.

In a review of health care statistics, rural areas were found to have more general practitioners, hospitals, and hospital beds per 100,000 population than urban areas. Yet, specialists are sorely needed, and rural areas were well behind cities in the number per capita of all doctors, as well as of dentists and nurses. Rural people must travel much farther to their hospitals than urbanites, and are likely to get less comprehensive medical services.

Mobile homes appear to be the answer for many low- to moderate-income families. More than 9 out of 10 mobile homes recently surveyed in New Hampshire are owner occupied. Over half of the households have only one or two members. Income of the occupants is generally below that of New Hampshire families as a whole. Median cost of new mobile home units ranged between $6,500 and $7,400, well below the cost of conventional housing in the State.

Food and Nutrition Research

Current statistics developed on per capita availability of 60 major foods or food categories have been especially important in the past year. They showed that 14 pounds less red meat were available per person in 1973 than the 189 pounds of 1972. There were also declines in supplies of chicken, eggs, dairy products, and fish. In fiscal 1974, in cooperation with the Food and Nutrition Service, ERS will attempt to isolate the factors of income, family background, and rural-urban location that affect participation in the school lunch programs. A major effort to upgrade food consumption statistics is being formulated. The latest comprehensive survey of family food-buying habits is over 10 years old.

### Farmer Cooperative Service

Farmers were particularly innovative this year in using cooperative business structures to expand the scope and benefits of their farming operations. Cotton producers applied "world's first" tags to two plants, a group of sugar beet growers entered processing in a big way, and activity in system efficiency was brisk among grain farmers. The Farmer Cooperative Service (FCS) supported these increasingly wide-ranging efforts to increase income by providing technical assistance, applied research, and educational resources.

Establishment of a Unique Mill

Taking advantage of an Agricultural Research Service (ARS) breakthrough 2 years ago, Plains Cooperative Oil Mill of Lubbock, Tex., opened the first mill to produce cottonseed flour for human consumption. The ARS laboratory at New Orleans found a mechanical method of removing a toxic substance that previously had prohibited use of the flour in human food. The discovery and subsequent practical application hold the potential of making cottonseed flour an important factor in helping solve the worldwide need for an abundant source of low-cost protein.

Marketing Activities

As part of a several-year study to bring new efficiencies to cotton marketing, an FCS economist developed a producer-based cotton marketing system. Concurrent with this work, he evaluated a Texas plan to integrate and coordinate industry functions beyond harvesting. These included storage, handling, ginning, and marketing. He appraised a reorganization plan involving the merger of three cooperatives into one new association and proposed marketing agreements with members. He flagged problem areas and compared the proposed system with present methods. Marketing costs for the new plan were found to be $18 per bale lower than costs for the old plan. Over 10 years, estimated savings could accumulate to $12 million.

A new cooperative, American Cotton Growers of Crosbyton, Tex., has been formed. A super gin, the first of its kind and employing several new marketing concepts, has been built and is in operation. Cotton producers of another State are considering a similar facility.

### Processing Plant to Minimize Costs

A sugar beet growers' association asked FCS to determine the optimum location and size for a processing plant to minimize capital investment and beet-hauling costs. A processing plant is being built at the recommended site. Savings resulting from the proposals are anticipated to be $3 million annually for at least 5 years.

### Assistance to Grain Marketing Cooperatives

Several grain marketing cooperatives called on FCS for advice about facility feasibility and market system improvement. Fourteen cooperatives were advised to work together in modernizing present elevators and building new facilities to gain the economies of scale possible in originating unit trains of grain. FCS reported to another cooperative that its plan to build a major grain facility in a major city was feasible. Two regional cooperatives accepted a recommendation that they set up a joint sales arrangement. Another cooperative has announced construction plans for a river terminal elevator at the recommended site. Estimated benefits in these projects range from 1/2 cent to 2 cents a bushel, totaling about $1 1/2 million annually.

### Assistance to Dairy Cooperatives

FCS developed guidelines for dairy cooperatives in the Northeast to reorganize marketing practices. Agency dairy specialists suggested a central marketing association and outlined milk-hauling and processing efficiencies. As a result, several obsolete plants have been closed. The project is expected to considerably improve the distribution efficiency of milk to consumers in this highly populated region.

### Petroleum Studies and Reports

With energy shortages of deep concern to farmer cooperatives, FCS petroleum analysts helped with several Government reports, studies, and assignments. The agency discovered potential benefits to farmers by expanding cooperative distribution of petroleum products in the South. According to 1970 figures, cooperatives provide only 6 percent of the petroleum farmers use in 11 Southern States. This share compares with 30 percent for the rest of the Nation. If cooperatives provided 25 percent, such a share would save farmers in this region $4 million annually.

### Fertilizer and Feed Manufacturing

Farmers have become major manufacturers of two other key production inputs, fertilizer and feed. U.S. farmers own some of the largest fertilizer manufacturing facilities in the world, but still rely on outside sources for the major portion of their plant food needs. FCS research found that farmers doubled purchases from their own plants in the period 1950 to 1970. For the fiscal year ending in 1970, farmer cooperatives were producing 8.3 million tons and handling 12.5 million tons of fertilizer materials annually.

In assessing cooperatives' position in feed manufacturing, an FCS analyst found from data compiled in 1969 that farmer-owned cooperatives produced 21 million tons of formula feed, or 21 percent of the U.S. total.

Bargaining

FCS surveyed 53 associations that bargain for farmers in one or more commodities, excluding dairy products. Associations providing figures indicated they handled products in 1971 valued at nearly $800 million. Principal benefits of bargaining associations, growers reported, were higher prices, better market information, price stability, assured market, more orderly marketing, supervised grading and inspection, standarized contracts, and legislative effort.

Research

The 100 largest cooperatives are stepping up expenditures for formal research, an agency survey found. From 1967 to 1972, the average cooperative nearly tripled business research expenditures, with the outlay increasing from $47,000 to $114,000. During the same period, average technical research expenditures nearly doubled, rising from $146,000 to $272,000.

As part of its continuing projects with universities, FCS published research conducted at Brigham Young University on livestock industry trends and implications for cooperatives. And an agency livestock specialist assessed the opportunities of veal calf production in the Northeast.

Assistance in Cooperative Development

Cooperative development assistance is being given to numerous groups of farmers and other rural residents who have limited resources. Two "how-to" type publications were published and a third is in production. They are based on successful experiences. One describes how to market crafts cooperatively. The second reports how orange grove workers formed a homeowners' association. The third describes how economic development can be achieved through cooperatives in low-income areas. Two cooperatives FCS helped build from the ground up are going strong in North Carolina. A vegetable marketing co-op will gross more than $500,000 its first full year. Sales of a feeder pig marketing cooperative will approach $1 million in its first year, ending early next year.

### Statistical Reporting Service

Expansion and improvement of modern data collection techniques, research on the potential use of satellite imagery in surveys, and fulfilling information needs with current and reliable estimates received primary attention from the Statistical Reporting Service (SRS) during 1973. The agency increased the use of multiple-frame survey sampling procedures for developing estimates concerning cattle and hogs. The survey methodology is now used in 14 major hog producing States and 28 major cattle States representing about 85 percent of the total hog and cattle inventories. SRS was able in 1973 for the first time to provide a mid-year cattle inventory report.

A special SRS survey conducted in February permitted an accurate updating of 1972 grain production and offered important supply information that became increasingly critical as the 1972-73 marketing seasons progressed. The need for added data about the 1972 crops was created when excessive wet weather in late 1972 hindered harvesting operations and raised concern about grain quantities actually brought out of the field. In line with the agency practice of updating information, a survey in July 1973 provided a current view of acreages planted for harvest following a difficult and protracted planting season plagued with excessive soil moisture throughout most of the major producing areas. Earlier acreage figures had been based on the March planting intentions report.

SRS took on a new task in 1973, that of reporting export sales. The Agriculture and Consumer Protection Act of 1973 directed exporters of certain commodities to report to USDA outstanding export sales weekly by country of destination and marketing year. The first SRS release was made in November, covering 28 commodities or their products going to 11 major geographic destinations.

Production and living expenditures of farmers came in for attention in 1973. SRS issued a preliminary report of farm production expenditures in April and followed up with a more detailed release in December. The first two data collection phases of the family living side of the project were conducted in April and July. The purpose is to update the weights used in computing the parity index, and to provide a current indication of how farmers are faring, compared with other groups in the Nation's economy.

In its continuing attempt to improve the value and effectiveness of its statistical program, SRS instituted adjustments in reporting activities for fresh and processed vegetables, potatoes, seed crops, popcorn, fruit, fluid milk and cream, manufactured dairy products, and weekly broiler and turkey data.

## Satellite Imagery

With the launch of the Earth Resources Technology Satellite (ERTS) in mid-1972, an intensive study was begun to learn how to identify crops and make acreage estimates utilizing satellite imagery. Results from SRS work with Missouri agriculture showed an overall correct crop classification of 50 percent based on imagery from one date, and 58 percent when three dates were employed. Other techniques may increase the level to 70 percent. The project is being conducted in selected areas of Missouri, Kansas, Idaho, and South Dakota. Imagery in the form of photographs was used as an aid in estimating pecan nuts on a tree. Statisticians found that information provided by a picture of a portion of the tree could be expanded to indicate the nuts on the entire bearing surface of the tree.

SRS, in cooperation with AID, provided training to 100 foreign students in the United States on crop and livestock estimating procedures. The agency also supplied technical assistance to a dozen nations through 27 staff members on 2-year or short-term assignments.